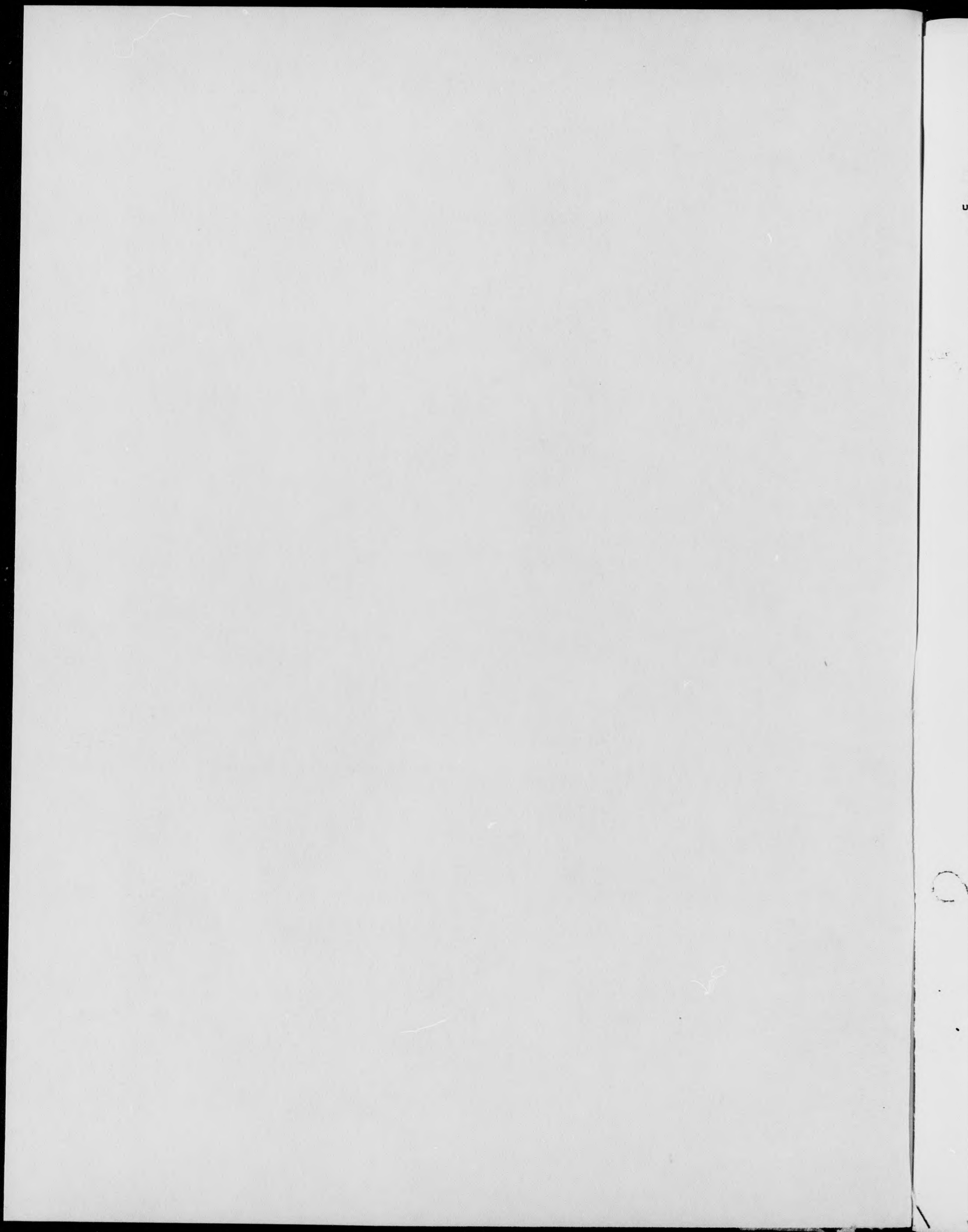




COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
STATE OF MARYLAND

UNIVERSITY OF MARYLAND
U. S. DEPARTMENT OF AGRICULTURE
COOPERATING

EXTENSION SERVICE

NEWS LETTER

(Maryland Vegetable Growers' Association)

Issued by

THE MARYLAND VEGETABLE GROWERS ASSOCIATION

W. R. Ballard, Secretary-Treasurer.

College Park, Maryland.

Maryland

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Vol. XIII. No. 1.

January, 1936.

The annual meetings have come and gone. The attendance was perhaps a little larger than usual but still too small to give a fair representation of this important industry. The attendance would no doubt have been larger except for conflicting demands, growing out of the many organizations, committees, etc. meeting at the same time. This difficulty was given recognition in the passing of a motion to appoint a committee to consider the possibility of holding the sessions at a time when these conflicts could be avoided.

The papers presented at the meeting were interesting and provoked considerable discussion.

A matter of vital interest to growers dealing on the Baltimore wholesale market came in for considerable discussion. The commission charges of 5 percent have prevailed in this market for a number of years. On January first of this year the commission charges were boosted to 8 per cent. This decided increase the growers feel is entirely unjustified, particularly since no improvement has been made in the facilities offered by the market.

For this reason the following resolution was presented and unanimously adopted.

"BE IT RESOLVED that the Maryland Vegetable Growers' Association go on record as being opposed to any increase in commissions on the wholesale markets in Baltimore, above the five percent commission prevailing during 1935:

AND be it further resolved that the Farm Bureau be asked to work toward the elimination of increases put into effect on January 1, 1936."

A copy of these resolutions were immediately placed in the hands of the Resolution Committee of the Farm Bureau and it is hoped that with the cooperation of the Vegetable Growers' Association this unsatisfactory market situation can be remedied.

Cucumber Tests. In a variety test conducted in Wicomico County on the farm of Frank Adkins several types of cucumbers, cantaloupes, water-melons, and lima beans were tested.

The plot which was approximately two acres in extent was plowed and fertilized, the fertilizer being furnished by the W. B. Tilghman Company, Farmers' Exchange, and the Peerless Fertilizer Company.

The cucumber plot was divided into two equal parts, one receiving a 5-8-5 fertilizer, the other a 5-8-12 to study the response to different amounts of potash. The cucumbers were planted in hills 3' x 6' on May 3rd. The varieties were planted as single row plots with Clark's Special planted every third row as a check.

Harvesting began about July 10th and continued at about two day intervals until July 29th. The number and weight of grade 1 and 2 cucumbers was secured at each picking. The varieties included were A.C., Woodruff's Hybrid, Clark's Special, Klondyke, Arlington White Spine, Straight-8, Longfellow, Early Fortune, and Davis Perfect.

The yield data for these varieties indicate that for total yield of marketable cucumbers, the varieties are quite distinctly divided into two groups, Clark's Special, A.C., Woodruff's Hybrid, and Klondyke grouping together as high yielding varieties with the remaining varieties being distinctly less productive. There was also a consistent tendency for the higher yielding varieties to grade out a higher percentage of No. 1 fruits.

From the standpoint of yield and market requirements such as size, shape and color, the A.C., Woodruff's Hybrid, and Clark's Special are the most desirable, ranking in the order given.

No definite conclusions could be drawn from the two fertilizer treatments.

Election of Officers.

The following officers were elected at the annual meeting of the Association:

President — Wm. Hotton, Salisbury.

Vice-President — E. W. Hawkins, Harmons.

Secretary-Treasurer — W. R. Ballard, College Park.

Directors: Francis B. Todd.
Elmer Kippleman.
J. Richard Fitzell.

Director Farm Bureau — Joshua Lynch.

Delegate Farm Bureau — R. T. Merritt.

Director Agricultural Corporation — Wm. G. Lynch.

NEWS LETTER

Issued by
THE MARYLAND VEGETABLE GROWERS' ASSOCIATION
W. R. Pallard, Secretary-Treasurer.
College Park, Maryland.

Vol. XIII. No. 2.

February, 1936.

Spinach Trials. Extensive trials of spinach varieties were carried on at College Park and Sparrows Point in the fall of 1935. Varieties included in the yield tests were: Reselected Bloomsdale, Dark Green Bloomsdale, Long Standing Bloomsdale, Old Dominion, Virginia Savoy, Hollandia, Gandry, and Amsterdam Giant. The first five listed varieties are savoy leaved types, and the latter three are smooth leaved. Virginia Savoy yielded heaviest in the savoy leaved group, and Hollandia was the most desirable of the flat leaved types. Hollandia yielded significantly higher than Virginia Savoy, however. This is a variety widely grown in California for canning purposes. For the fresh market, the flat-leaved types are not considered so desirable, since they do not seem to hold up so well.

The above listed varieties are being wintered over at College Park, for observations on winter killing. Maryland growers generally over-winter Virginia Savoy and old Dominion. These two varieties appear to be the most resistant to low temperatures.

Although Virginia Savoy is desirable for the fall and over-wintered crop, it should not be used for spring planting because of its tendency to form seed stalks so early. Dark Green or Reselected Bloomsdales should be used in the spring. There seems to be little, if any, difference between the two.

These varieties will be further studies this spring.

Trials With Cool Season Vegetables. A preliminary study was conducted during the past year to note the reaction of certain of our cool season vegetable crops to the environment found in the northwestern part of the state. Four crops -- cauliflower, Brussel's sprouts, broccoli, and lettuce were selected for trial and grown on the farm of Mr. Wm. P. Deberry, near Oakland, Maryland. An area of half an acre was made available for our use in the field now being leased by the Department of Pathology.

One planting was made of each crop. The season proved to be agreeable in most respects and as a whole the crops did very well. Mr. Deberry seemed to be interested in the work and did a good job in caring for the plots. Since it was impossible for us to be at Oakland during the harvest season, the task of securing the data was entrusted to Mr. Deberry and County Agent, J. H. Carter. This cooperation is gratefully acknowledged.

Cauliflower. Six strains of cauliflower, furnished by E. Surh Company, were used in this trial. The seed was sown in the greenhouse April 25th and seedlings transplanted into flats soon after their emergence. The plants were removed from the flats on June 10th and carried to Oakland and planted the follow-

ing day. The seven weeks allowed for the growth of the plants while in the greenhouse proved to be too long, and it was necessary to severely check their growth during the last week, but after setting in the field these plants soon became established and no premature heading resulted.

Two rows of 26 plants each were set for each variety or strain in an area 36' x 52'. The harvest season extended over the period August 15th to October 28th. The observations and data secured are summarized in table I which follows.

Cauliflower Varieties at Oakland, Maryland, 1935.

Variety or Strain.	Percent Harvested September 7.	Marketable Heads.		Characteristics of the Head.
		Number *	Percent	
1. Success	100	42	80	
2. Snowball-125	100	48	92	Many good heads, some were leafy.
3. Snowball-84	100	48	92	Tinged purple, some tendency for looseness.
4. Erfurt-72	67	43	82	Good compact heads.
5. Snowball-200	70	47	90	Some tendency for leafy heads.
6. Erfurt-215	15	52	100	Large, of good quality.

*Yield corrected to a full stand of 52 plants.

The varieties are listed in the above table in the order of time of maturity with the variety Success being the earliest. The first three varieties were mature and harvested by September 7th. Erfurt #72 and Snowball #200 were later, while Erfurt #215 was the latest of the six varieties.

On the basis of quality the later varieties were best. Erfurt #72 and Erfurt #215 were rated as being of highest quality. These varieties produced good solid heads well protected with leaves curled from the outside which blanched the heads to a five degree of whiteness.

In conclusion to the cauliflower trials it can be said that the climate conditions were found to be very favorable for the growth of cauliflower during the past season. Yields of from 80 to 100 per cent marketable heads were secured. A wide range in the time of maturity of the various varieties was noted. The two Erfurt strains numbers 215 and 72 were late, but produced heads of especially good quality. The earlier varieties might be found to be useful for an early summer crop, but certainly would not be as desirable as the later varieties for the fall crop.

Broccoli. The variety Green Sprouting was grown. Seed was planted in the greenhouse May 2nd, and plants given in plots until June 10th, when they were removed and taken to Oakland for transplanting into the field on June 11th and 12th.

SUMMARY OF REPORTS

Given at the

CANNING CROPS CONFERENCE

Sponsored by the Maryland Agricultural
Experiment Station and Extension
Service, in cooperation with
the Tri-State Packers'
Association

College Park, Maryland

February 25 and 26, 1936

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Welcome to the University

H. J. Patterson, Director, Maryland Experiment Station

The group was cordially welcomed to the University and offered the use of all available facilities.

It was pointed out that Maryland was a pioneer state in commercial canning. Technical problems were the chief worry of the canner in these early times, but many of the most important considerations now are in connection with the production of raw stocks. Good products create consumption, and it is therefore increasingly necessary to have high-quality raw products delivered to the cannery. The raw stock problems are now multiplying faster than the technical workers of the industry and the college staffs.

Competition is getting keener between canners, and real competition is developing with market vegetables, which indicates the need of a lot of cooperative effort within the industry, particularly in the consideration of marketing problems.

The publication recently prepared by Mr. C. G. Woodbury, of the National Canners' Association, "Agricultural Research Relating to Canning Crops", was complimented and commended to the attention of canners and production men. The publication gives a review of canning crops work in progress and publications issued since 1932.

Attention of the group was called to the availability of Government funds with which research projects will be set up to work out regional problems. The funds will be increased year by year until the annual appropriation reaches \$2,000,000. It was suggested that canners and growers in the Tri-State area look ahead a year or two and plan towards the setting up in this section of projects helpful to the canning industry.

Pea Aphis Control Work

E. N. Cory, University of Maryland

Recent experimental results by Mr. J. E. Dudley and his associates have been distributed in mimeographed form as publication E-365 of the Bureau of Entomology and Plant Quarantine. Preliminary work with derris as a control for pea aphid was conducted last year in the greenhouse, using ground derris at the rate of $1\frac{1}{2}$ to 5 pounds per 100 gallons of water, with a suitable spreader and wetting agent, representing .0066% to .022% rotenone. This spray killed nearly 100% of the aphids on treated plants over a period of from three to five days and apparently prevented practically all reproduction during that time. Summer field tests on both small and large plots, using ground derris at the rate of from $\frac{1}{4}$ to 5 pounds per 100 gallons, representing .009% to .022% rotenone, killed more than 90% of the aphids within three to five day periods, with little or no reproduction taking place during that time. The treated plots gave an increase in yield of approximately 88% over the untreated plots.

Applications made prior to aphid infestation protected the plants from appreciable damage for several weeks. Heavy applications of derris sprays after an infestation had started protected the peas for nearly a month. Heavy applications after an infestation became severe killed approximately 90% of the aphids. Concentrations of derris as low as $\frac{1}{4}$ to $\frac{1}{2}$ pounds per 100 gallons killed about as many aphids as 3 pounds.

Observations and the recently published experimental work of Dr. E. M. Searls indicate that peas with yellow foliage are more resistant to aphid injury than those with green foliage. In crosses of Yellow Admiral and Onward with the green-foliaged Perfection, progeny carried through to the fifth generation have shown that those with green foliage have been definitely resistant to injury while the yellow-foliaged types have been susceptible. If tests show that the factor of resistance is present in some pea suitable for crossing with the Alaska, it may be possible to breed a strain of Alaska with yellow foliage.

For a number of years in experimental work in Garrett County it has been observed that soil moisture played a big part in controlling the insect. Spraying was of most value in those fields having an adequate soil moisture content. It seems, therefore, that it might be well to study the effect of the maintenance of sufficient humus in the soil to insure an ample water supply throughout the growing period of the peas.

Nicotine at the rate of one part to 500 parts of water, plus 4 pounds of soap per 50 gallons, applied with a sprayer mounted on a truck and equipped with a 30 nozzle boom has given very satisfactory control in the Oakland section at a cost of about \$1.75 per acre for materials. This method has been used on broadcast peas with very little damage resulting from the truck.

The other recommended practice is the use of a 3% nicotine dust, applied with a power outfit equipped with a ground trailer. In order to get maximum results with the dust the temperature must be high and there must be practically an absence of wind. This combination is difficult to get in Maryland, because early in the morning and late in the evenings when the wind is absent, the temperature is usually too low.

Until the method with the use of derris becomes standardized, it is suggested that the pea grower adhere to nicotine spray or dust for aphid control.

Pea Production

T. H. White, University of Maryland

It was not a very difficult problem years ago to grow a good crop of peas. There was plenty of available manure and peas usually followed heavily manured crops, such as cabbage. The first difficulty observed was on the Eastern Shore where the supply of manure was limited.

It is now evident that we must rely to a large extent on commercial fertilizers to supplement barnyard manure, and in many cases it will be necessary in the future to keep more stock in order to supply sufficient manure.

Artificial inoculation with nodular bacteria is very important in some soils which are not naturally inoculated. When the seed is not inoculated under such conditions, the plants do not make a normal growth and injury from root rot seems to be more severe. Root rot always seems to become worse when the plants have a set-back.

Land which has been in cultivated row crops is not well suited for early spring crops the following year. Such land seems to have lost a part of its fertility, due possibly to some action of the sun. In rotation experiments, conducted at Ridgely to determine the best crops to precede

peas, it was found that crops, such as tomatoes, which shaded the ground gave the best results. The apparent injurious effects of lima beans on succeeding crops may be due to the influence of the direct sun rays on the soil. It is very desirable to have land in sod as often as possible. The numerous roots make drainage better and improve the physical condition of the soil.

Growers should keep in mind the fact that the soil organisms require nitrogen in the decomposition of fibrous organic material. If large amounts of this material are turned under, there may not be sufficient nitrogen present to accomplish decomposition and support plant growth at the same time. Therefore, if a large part of the material is still not decomposed at planting season, an additional amount of nitrogen should be supplied. Nitrogen might also be supplied when the material is turned under.

Experiments to try to determine the best time for plowing for peas have been conducted at the Ridgely Sub-Station with results varying from year to year. From a standpoint of yields, it seems that either fall or spring plowing is satisfactory. Because of drainage, however, some soils can be worked into better condition early in the season if plowed in the spring.

Crop plants in which flowers and seeds are to be produced usually require a large amount of phosphoric acid. With peas the amount of phosphorous required depends largely on the individual soil. Early spring crops generally require extra nitrogen because the soil organisms which liberate nitrogen from organic material are not active in the cold season. Tests in this section show that peas need a large amount of nitrogen in the fertilizer.

Calcium cyanamid is known to be a very caustic form of nitrogen if applied in contact with seed or plants. For this reason, it was assumed that it might have some sterilizing effects on the pea root rot fungus in the soil if applied in large amounts. Tests were run on infested plots last year in which amounts of cyanamid, ranging from 250 to 1,000 pounds per acre, had been applied the preceding fall after plowing. The peas made a much better growth and yield on the treated plots than on the check, which received no fertilizer, and partially overcame the effects of the disease. Counts of root rot infection indicated that practically all plants were infected but that the injury was worse on the check plot. Applications of 500 and 750 pounds of cyanamid per acre gave higher yields than lighter and heavier treatments. Cyanamid does not leach readily from the soil and can be applied a long time ahead of planting. Effects of the fall application were still apparent on the yields of lima beans planted after the pea crop.

In tests of complete fertilizers on peas at Ridgely, during four years, a fertilizer analyzing 6-6-5 gave higher yields and better quality than those with a lower percentage of nitrogen. The 6-6-5 gave an average yield per acre of 1,164 pounds. A 4-8-5 fertilizer yielded 1,011 pounds and a 2-8-2 was last with 827 pounds.

Field tests at Ridgely have indicated that the most profitable seeding rate is from four to four and a half bushels per acre.

Soil acidity seems to be an important factor in pea production. If there is any doubt about the soil reaction, tests should be made and lime applied if needed.

Report of Committee on Raw Pea Grades

James M. Shriver, B. F. Shriver Co., Westminster, Md.,

Since the fall meeting of the Tri-State Packers' Association a group of canners and University of Maryland men have been considering the possibility of developing work for the coming season looking towards the determination of grades for raw peas which might be used as a basis for purchase from the grower. This group held a conference at College Park in December and another in Baltimore in early January, at which time a committee was appointed to work out a research procedure for the coming pea season. This committee is composed of James M. Shriver, Chairman, Tri-State Packers' Association; Harry H. Nuttle, Maryland Farm Bureau; Leroy V. Strasburger, Strasburger and Siegel; and S. B. Shaw, Maryland State Department of Markets. The committee has since met and considered proposed plans of procedure. These proposals call for study along the following lines:

1. Sieve sizes:- The percentage of each sieve size, or certain of them, to be used as an index of quality.
2. Amount of juice:- The amount of expressed juice to be studied as a measure of quality.
3. Refractive index:- Refractometer readings of expressed juice,
4. Brine separation:- Several strengths of brine to be used to separate the peas into floaters and sinkers.
5. Yield records:- Definite areas of peas to be harvested from a uniform field when the peas are at the following stages of maturity: (a) very young and very tender, (b) young and tender, (c) starting to mature, and (d) mature.

Where feasible the separations and measurements will be run on the various sieve sizes and run-of-the-pod samples, blanched and not blanched, and on floaters and sinkers from the brine separation. Canning tests and chemical analyses will be run parallel with the above procedures as a measure of quality.

All or a part of this set-up will be conducted at one cannery and the Ridgely Sub-Station on the Eastern Shore and at two canneries in Western Maryland.

The various tests will be conducted on each harvesting from the yield-record plots. The yields of the various harvestings, coupled with the quality determinations, should be of some value in determining payments.

As is commonly known there is very little available information for intelligently buying peas on grades, and it is hoped that the results of this work will furnish a satisfactory basis. Some canners are buying on the basis of sieve sizes and others are planning to use brine separation. In most cases a fair basis of payment has not been worked out. It usually resolves into a matter of the canner contracting sufficiently low and then giving a bonus at the end of the season.

Carelessness in Canning Practices

F. M. Shook, Tri-State Packers' Association

Much of the carelessness in canning starts before the actual canning procedure. Some of the important pit-falls of the industry were discussed under the following six points:

1. Weak financing:- Many canners do not make proper arrangements for financial backing ahead of the season's work. This frequently has a demoralizing effect on the market, due to forced sales.

2. Water supply:- The lack of a sufficient supply of good water is a particularly important weakness with many Eastern canners. Many peas are improperly cooled because of a deficient water supply and the air cooling of tomatoes causes injury that cannot be overcome in the other canning operations.

3. Contracts:- Both sales contracts and contracts with the grower are woefully weak in the majority of cases. The weakness of growers' contracts in sections where raw products are boot-legged is clearly evident. Some canners are writing a measure of damage into their contracts which require a heavy payment per acre in case all of the product is not delivered to the cannery. Most contracts contain many useless clauses which are not meant to be enforced and which should be deleted. Sales contracts often mean very little, too. A contract should be just what the name implies, to be followed in all details, and certainly in regards to the price and time of delivery.

4. Daily sales reports:- Sales figures should be available within the industry. Any stock market quotation gives at least the high, low, and closing figures, but the canner accepts the broker's statement of market conditions, which is usually the absolute minimum.

5. Acreage:- Improved production practices are bringing about increased yields per acre, but very few canners think to reduce their acreage. There is a tendency for canners to figure their canning capacities in terms of the average season. The pea canner in deciding on his acreage doesn't count on any rain during the canning season and forgets about Sundays, and usually winds up with sub-standard peas.

6. Canning practices:- Waste can be seen at every corner in most canneries. One canner last year washed away enough lima beans to run an ordinary size plant, and it's hard to find a tomato cannery where the peeling waste is not excessive. Peas are commonly blanched so long that the sugars are largely removed. Cooling problems are of course hooked up directly with water supply. All canners know the trouble but hate to make the initial investment.

Greetings from the Extension Service

T. B. Symons, Director, Maryland Extension Service

Dr. Symons expressed the pleasure of the entire Extension Service in having the canners and production men on the campus. He suggested that everyone should take notes of the proceedings to be able to refresh their minds on the volume of information that was being given in the meeting.

Standardization of both raw and canned products is a field offering enormous possibilities. Everyone seems to be in favor of standardized products, but few have made any serious effort to improve the condition. Standardization begins with the raw product, but we must go farther back than just grading the product when it arrives at the cannery. Field production should have its share of work towards further improvement.

It is gratifying to see the interest which is being manifested by some of the pea canners in buying the raw product on grades. It is felt that the cooperative efforts of several of the Maryland canners with the college specialists this season in trying to work out a practical system of grading inspection will be of outstanding benefit to the industry.

Dr. Symons expressed the hope that everyone interested in canning would forever try to improve the industry as a whole. He spoke of the late Mr. Nelson H. Fooks as a man burning with desire to help the industry, particularly in his enthusiasm for corn and tomato seed improvement.

Canners were advised to determine market demands, to standardize their products, to give more consideration and effort to marketing, and to develop the idea of cooperation with their growers. In conclusion, Dr. Symons expressed the hope that canners would give more attention to the control of raw products production.

Yellow Sweet Corn - Its Future

Francis S. Silver, Wm. Silver & Company, Aberdeen, Md.

Eight-row Golden Bantam has been packed principally in Maine, New York, and Minnesota. It has always been highly regarded as a table delicacy because of its attractive flavor, its color and consequent "eye appeal", and its distinctive size and shape. As soon as this variety found its way into cans it was loudly acclaimed by the trade and the buying public. The early packs were quality items, and all was crushed or cream style. It commanded a premium of 20¢ per dozen over fancy cream style Crosby, which previously had been regarded as the ne plus ultra of the cream style pack. Prior to 1925 Crosby represented the bulk of the fancy corn produced in the three above named states, but in the succeeding ten years it was rapidly supplanted in volume and preference by Golden Bantam.

Because of its popularity and profit, Bantam soon became the target of competitors who failed to maintain the original quality of the early packers. Crosses were developed by seedsmen which outyielded the tasty but more delicate eight-row Bantam, and because of these better yields could be bought, canned, and sold more cheaply, and, also, could be grown and canned over a wider area. These substitutes were packed in volume and sold cheaply. They rapidly drove the more expensive eight-row Bantam from the shelves - and, likewise, drove the customers away from yellow corn!

The next important step was the breeding of hybrids in an effort to develop an improved corn in which the flavor and tenderness of eight-row Bantam would be retained while increasing the yields and resistance to wilt. Few of these hybrids had wide adaptability or produced the superior quality which alone would justify the high seed cost.

Two very important things occurred about 1930: first, the development of Golden Cross Bantam, and, second, the phenomenal spread of whole-grain packing. The development of Golden Cross Bantam gave the canner for the first time a hybrid corn of high yielding ability, fine quality, and wide adaptability, and which was outstandingly resistant to Stewart's disease and performed well in dry weather. This latter point is a very important consideration in Maryland, especially in the western and northern sections.

The fine quality and high yield per acre of Golden Cross Bantam enabled the canners of quality corn who had heretofore featured eight-row Bantam to pack a corn of splendid quality at lower cost, and thereafter Bantam became a good 15¢ seller where before it had been a 20¢, or luxury, item. Great strides were made rapidly and consumption and production expanded by leaps and bounds. Four and a half million cases were packed in 1934, a dry year in the West, out of a total of 11,119,000 cases, and in 1935 the production mounted to 8,475,141 cases. It was one of the few items to hold its opening price in this year of general price declines, and, in the case of whole-grain, registered an advance of from 10¢ to 15¢ per dozen.

The spread of whole-grain packing in the West was due to the 1930 drought in the Tri-State territory, which sent the price of Shoe Peg soaring to \$1.87½ per dozen, and to the development of two good makes of whole-grain cutters. Two great western companies jumped into the packing of whole-grain Bantam on a quantity basis. These and a number of smaller companies are making a business-like job of packing high quality and advertising their product.

Since the development of Golden Cross Bantam, Maryland canners can pack good whole-grain and crushed Bantam. The small canner to succeed must do one of two things, either pack better quality than the large competitors or cheapen the product and sell to the chiseling cash-and-carry type of merchants. The former course is advised.

The above is a history of yellow sweet corn and a picture of the competitive set-up faced today. As to the future, one man's guess is as good as another's. The 1936 acreage will be larger. If the canners will pack high quality and sell it intelligently, past growth and popularity may be maintained, but there are serious dangers ahead. So watch your quality and watch your step!

Varieties and Strains of Sweet Corn

R. G. Rothgeb, University of Maryland

(Due to a special request of corn canners, this report is presented in considerable detail).

The first step in the effort to obtain better sweet corn varieties for Maryland is the critical comparison of existing strains and hybrids regardless of where or how they were originated. This is particularly true for Maryland, because the bulk of our seed is produced outside the State. Practically all of this has been bred in other areas. Fortunately, a number of varieties have a rather wide adaptation, but others, such as Crosby and Golden Bantam, are failures here.

Maryland Trials:- Three types of field tests are being conducted in Maryland; first, preliminary field trials at College Park; second, regional trials for several locations in the State; and, third, quality and canning tests, under the supervision of Dr. H. B. Cordner of the Horticultural Department. The latter work is reported elsewhere in this report.

New Material is first placed in the preliminary trials at College Park, where detailed observations and records are made of its performance. Some stocks can be discarded after the first year. Material which survives several years of preliminary trial is then ready for regional and canning tests.

Seed stocks are obtained from breeders and seedsmen, many being presented voluntarily. The College Park trials have been conducted on a sandy loam soil of medium fertility. An excess of seed has been planted by hand in hills $3\frac{1}{2}$ feet each way and later thinned to two stalks per hill. Planting has been done from May 18 to May 24. Each trial entry has been planted in four replicate plots of ten hills each. The corn has been harvested in one picking at the milk stage, from 18 to 23 days after approximately one-half of the plants had silked, depending upon the variety.

Trial Results:- Annual reports giving the records for all trial entries have been distributed in mimeographed form. As a class, early or short season varieties have not done well at College Park. Most of them are susceptible to wilt and lack vigor. By pollinating some of these early varieties with Purdue Bantam (P 39), one of the parents of Golden Cross Bantam, breeders have obtained top crosses with considerable vigor.

Table I. Cross versus early variety for maturity and yield of husked marketable ears, 1935.

Variety or Cross	Days	Tons	Dozens
Spanish Gold	66	0.24	198
Spancross - P39	71	.87	400
Golden Sunshine	66	.27	129
Suncross - P39	73	.70	280
Early Yellow Sensation	73	.26	117
Sencross - P39	73	.91	400
Golden Bantam	73	.66	312
Bancross - P39	75	1.08	443
Golden Cross Bantam	78	1.56	599

As can be seen from Table I several such crosses, though somewhat later in maturity, more than double the yields of the open-pollinated varieties from which they arise. None of them, however, equal the yield of Golden Cross Bantam, which is several days later.

In Table II hybrids which have been on the market for several years are compared with open-pollinated stocks of similar type. One strain of Evergreen has been grown and selected in Maryland for at least five years. At present it seems to be showing up better than similar material from Connecticut. For several years the Maryland Station has cooperated with Associated Seed Growers and B. F. Shriver Co. to establish locally adapted

strains of Stowells, Narrow Grain, and Country Gentleman. Comparisons with Connecticut strains favor the Maryland stocks, the greatest improvement being in the case of Country Gentleman where the gain was over 25%.

Table II. Three year comparison of varieties and hybrids for tons per acre of husked marketable ears at College Park

Name	1933	1934	1935	Ave.	Per cent of total wt.
Stowell's Evergreen (Md.)	1.47	2.10	1.74	1.77	55
Stowell's Evergreen (Conn.)	1.56	1.32	1.39	1.42	48
Ever. Hybrid 14x5 (Asgrow)	1.71	1.76	1.79	1.75	56
Narrow Grain Ever. (Asgrow)	1.30	1.32	1.36	1.33	50
Hybrid 26x15 (Asgrow)	2.13	2.47	1.46	2.02	57
Country Gentleman (Asgrow)	1.57	1.77	1.13	1.49	54
Hybrid 24x19 (Asgrow)	1.60	1.94	1.52	1.69	58
Golden Bantam	.43	1.04	.66	.71	44
Bantam Evergreen	.89	1.46	.97	1.11	43
Top Cross Bantam	--	1.48	1.08	1.28	55
Golden Cross Bantam	1.64	1.56	1.56	1.59	52

Hybrid 14x5 seems to be better than the commercial Stowell's Evergreen from Connecticut but no more productive than the adapted Maryland strain. However, it is superior from the standpoint of uniformity and ear shape.

Hybrid 26x15 definitely has outyielded the open-pollinated variety. It has a short tapering ear, usually with 18 or 20 rows of small kernels.

Hybrid 24x19 has given a slightly greater tonnage of ears than Country Gentleman. It is uniform, has a big well-shaped ear with a rather large cob which doesn't fill well under adverse conditions.

The strains of Bantam Evergreen used in these tests have been neither productive nor of high quality. Top Cross Bantams vary according to their parentage. The better ones have been somewhat below Golden Cross Bantam in yield, but they compare very favorably in quality.

Table III shows the yields of several varieties and crosses in regional tests in 1935. Golden Colonel is a yellow variety with the Country Gentleman kernel arrangement. The ear quality has been good and the yield about the same as Country Gentleman.

As can be seen from Table IV, Golden Cross Bantam has performed rather consistently at College Park for five years. As a representative of its type it has no superior and can be recommended for both canning and market. Most of its worm damage has been confined to the tips where it can be trimmed off, and the actual damage has not been as great as Stowell's Evergreen.

Table III. Tons of husked marketable ears at four locations in 1935

Name	West-minster	Ridgely	Beltsville	College Park	Ave.
Stowell's Evergreen	1.27	1.58	1.30	1.39	1.39
Hybrid 14x5	1.44	1.83	1.39	1.79	1.61
Narrow Grain Evergreen	.96	1.53	.87	1.36	1.18
Hybrid 26x15	1.00y	1.55	1.49	1.46y	1.38
Country Gentleman	1.13	1.88	1.21	1.13	1.34
Hybrid 24x19	.98y	1.88	1.56	1.52	1.49
Golden Colonel (Conn.)	.81	1.36	1.24	1.20	1.15
Golden Colonel (West.)	.89	1.94	1.13	1.12	1.27
Top Cross Bantam	.58y	1.13	.81	.86	.85
Golden Cross Bantam	.99y	1.78	1.19	1.56	1.38

y - harvested young

Table IV. Five year performance of Golden Cross Bantam at College Park

Observation	1931	1932	1933	1934	1935	Ave.
Half silk - days	60	61	58	57	58	58.8
Height - inches	71	66	69	64	67	67.4
Plants dying - Pct.	0.0	1.4	1.7	3.2	7.9	2.8
Ear length - inches	---	8.4	7.4	8.0	8.4	8.1
Tons per acre (total)	3.14	3.38	3.41	2.78	2.95	3.13
Marketable - Pct.	---	61	48	56	53	54.5
Marketable ears - doz.	769	770	781	670	599	718
Marketable ears per plant	1.4	1.5	1.5	1.2	1.1	1.3

In a rate of planting test made on three different dates in 1935, Golden Cross Bantam did not make a higher yield with three plants per hill than with two plants. The corn was not grown on fertile soil, however, and as can be seen from Table V the yields were low. The May 20 planting was handicapped further by drought at a critical stage. Under more favorable conditions of soil and season the three-stalk rate probably would have given the better yield.

Table V. Effect of rate and date of planting on Golden Cross Bantam at College Park, 1935

Plants per hill (3.5'x3.5')	Days to maturity	Tons marketable	
		2	3
Planted May 1	94	1.27	1.19
Planted May 20	80	.80	.86
Planted June 11	76	1.16	1.17
Average		1.08	1.08

Because of short fodder and the small size of seed, Golden Cross Bantam is apt to be planted too thick. These limited trials indicate that for canning purposes it should be planted to give about the same stand as would be proper for Evergreen on the same land. Seed samples examined have varied from 2,300 to 3,200 seeds per pound. Six pounds of the larger size would more than plant an acre at three stalks per hill, spaced 42 inches each way. Each grower should test out his planter on bare ground to determine the proper plates to use.

Time of planting has a great influence on the number of days required for sweet corn to reach the canning stage. Early plantings require more time to reach the canning stage than do plantings which utilize fully the warmth and sunlight of mid-summer. Table V shows that the May 1 planting required 94 days to reach the canning stage while that planted June 11 required only 76 days. The first part of May in 1935 was cooler than normal, which of course caused the first planting to take longer to mature than usual. Successive plantings made early should be spaced at least two weeks apart in order to provide some interval at harvest time.

Chart I is based on maturity data obtained by Magoon and Culpepper, of the U. S. Department of Agriculture, at the Arlington Farm in Virginia in 1924. Beginning on April 28 periodic plantings of a strain of Golden Bantam were made throughout the summer. The bars on the chart indicate the date of planting, number of days to maturity, and date of harvest at the canning stage. A curve representing the trend of normal mean temperature is drawn above the bars. The first planting was made April 28 and the corn was harvested at the canning stage on August 5, an elapse of 99 days. Successive plantings required fewer and fewer days for maturity until a minimum of 75 days was reached for the June 17 planting. Subsequent crops which ripened in the cooler weather of September and October required an increasing number of days.

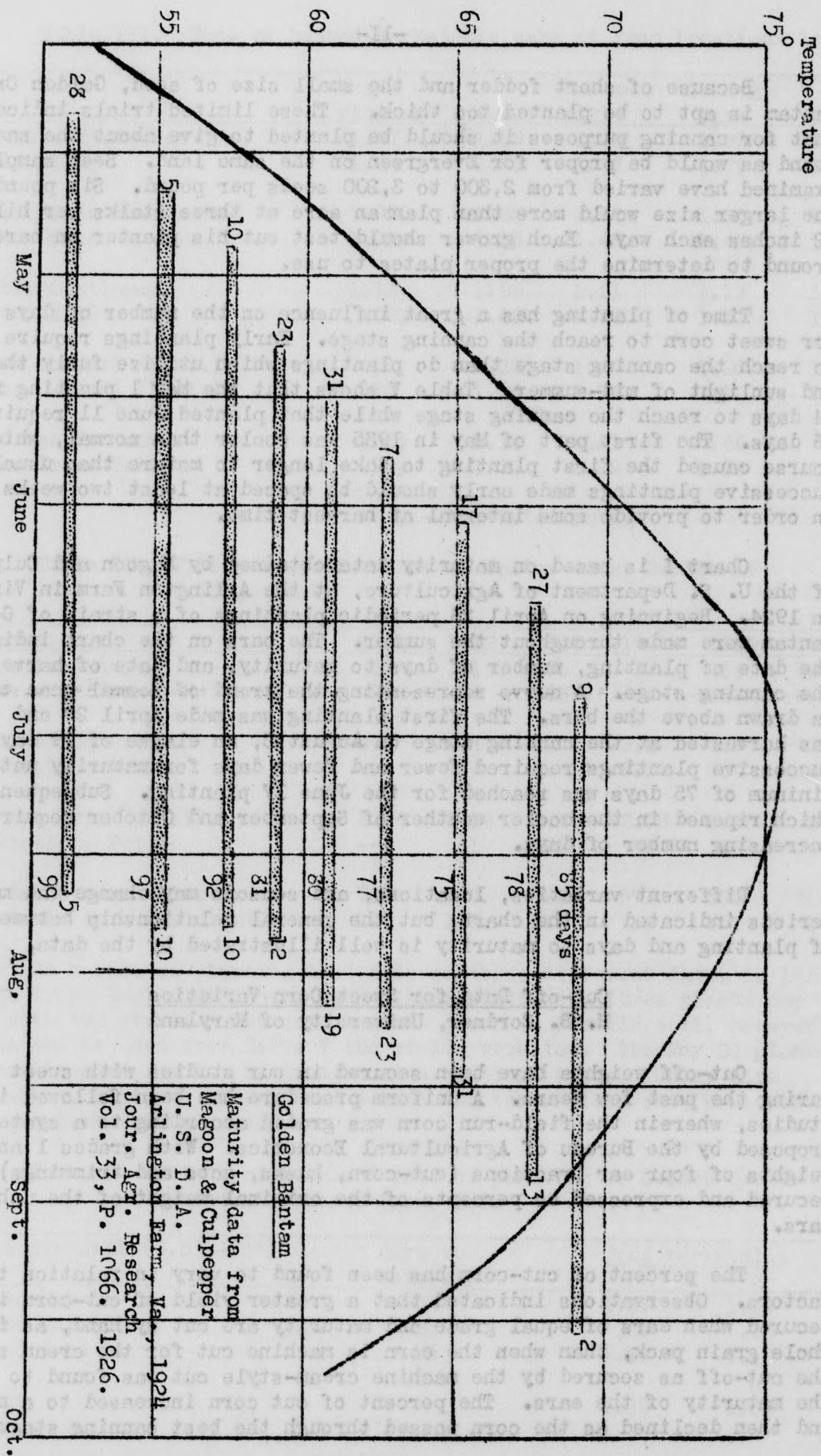
Different varieties, locations, and seasons may change the maturity periods indicated in the chart, but the general relationship between time of planting and days to maturity is well illustrated by the data.

Cut-off Data for Sweet Corn Varieties
H. B. Cordner, University of Maryland

Cut-off weights have been secured in our studies with sweet corn during the past few years. A uniform procedure has been followed in these studies, wherein the field-run corn was graded according to a system proposed by the Bureau of Agricultural Economics. With grades 1 and 2 weights of four ear fractions (cut-corn, husks, cobs and trimmings) were secured and expressed as percents of the original weight of the unhusked ears.

The percent of cut-corn has been found to vary in relation to several factors. Observations indicated that a greater yield of cut-corn is secured when ears of equal grade and maturity are cut by hand, as for the whole grain pack, than when the corn is machine cut for the cream style pack. The cut-off as secured by the machine cream-style cut was found to vary with the maturity of the ears. The percent of cut corn increased to a maximum and then declined as the corn passed through the best canning stage.

Chart I. Planting Date and Days to Maturity



In comparing the cut-off weights of grade 1 and grade 2 ears it is estimated that the former, as an average, yields about 6 lbs. more cut corn per hundred lbs. of unhusked ears. This is equal to around 20-25% more cut-off in favor of ears classed as grade No. 1.

Variety comparisons conducted for two years indicated that Golden Cross Bantam, Country Gentleman and Top Cross Bantam yielded the highest cut-off, ranking in the order named. The three white hybrids, Stowell's 14x5, Country Gentleman 24x19 and Narrow Grain 26x15, did not cut as much corn per ton as the corresponding open-pollinated varieties.

U. S. Grades for Raw Corn

G. Frank Thomas, Thomas & Company, Frederick, Md.

Every canner appreciates that in order to can good corn it is necessary to start with good raw stock. In order to get a good-quality raw product when buying on the flat-rate basis there is usually a continual fight between the canner and growers. This can be eliminated when buying on the basis of grades.

As an experimental project with the State Department of Markets last year, all of the corn delivered to the Adamstown and Gaithersburg plants of Thomas & Company were graded according to U. S. Grades. The Company did not pay for the product on the basis of grades, but wished to have the inspection made to determine the actual quality of the corn delivered to each factory, with the thought of possibly using this information as a basis for determining a schedule of prices for the purchase of the product in 1936.

State inspectors were located at each factory. Samples of 50 pounds of corn were taken from each load delivered. These were run through an old discarded husker, graded, and the various proponents weighed and the final figures expressed in percentages. In the maturity classification, class A corn is in the milky stage; class B, early dough; and class C, late dough.

Stowell's Evergreen was grown at Adamstown and Golden Cross Bantam at Gaithersburg. At Gaithersburg the corn was sorted on the belt and the best used for whole grain. The remainder made extra standard cream style. The season was unfavorable for high-quality corn, and higher grades would be expected in a normal season.

The results of the grading at each factory and the average for the two plants are shown in the following tables:

Gaithersburg factory, grading from Aug. 2 to Sept. 20, 1935

	<u>No. 1</u>	<u>No. 2</u>	<u>Culls</u>	<u>Husk</u>
Average grade	49.64%	5.05%	12.44%	32.87%
	<u>Class A</u>	<u>Class B</u>	<u>Class C</u>	
Average maturity	53.13%	37.63%	9.24%	

Adamstown factory, grading from Aug. 13 to Aug. 30, 1935

	<u>No. 1</u>	<u>No. 2</u>	<u>Culls</u>	<u>Husk</u>
Average grade	59.03%	4.61%	6.98%	29.38%
	<u>Class A</u>	<u>Class B</u>	<u>Class B</u>	
Average maturity	53.75%	39.03%	7.22%	

Average of both factories

	<u>No. 1</u>	<u>No. 2</u>	<u>Culls</u>	<u>Husk</u>
Average grade	53.30%	4.88%	10.31%	31.51%
	<u>Class A</u>	<u>Class B</u>	<u>Class C</u>	
Average maturity	53.39%	38.23%	8.38%	

Corn Earworm as a Tomato Pest

L. P. Ditman, University of Maryland

In view of the recent losses of tomato products in certain parts of the country caused by contamination with corn earworm larvae, a survey was made of the tomato canning regions of Maryland in order to determine the probable seriousness of the pest. Fifty per cent of fields examined showed no evidence of injury. In the remaining fields an average of one fruit per hundred plants was injured, in one case one fruit on every fifty plants. Raw stock examined at canning plants showed an average of one per cent injury, in one case as much as four per cent. In general, the situation was not considered serious. Infestation records for corn at College Park indicated that the corn earworm was slightly less prevalent in 1935 than in any of the past four years. There is considerable likelihood of years of severe earworm injury, or there may be sporadic local outbreaks, in which case tomatoes used for juice; pulp, etc., will have to be vigorously culled before canning. The insect can be controlled with insecticides, but by the time the infestation becomes apparent to the canner it will be too late for its effective application.

Corn Earworm in Tomatoes

B. J. Howard, Food and Drugs Administration, Washington, D. C.

In some parts of the country this insect is of great importance. As far back as 1918 the worm was found in tomatoes in California canneries. At that time, there was no method for detecting them in catsup and other products. About a year ago, a satisfactory method for detecting small parts of the insect in canned goods was perfected. The method consists, roughly, of placing the canned material in a flask, adding a given portion of kerosene, or other desirable oil, shaking thoroughly, and separating the upper layer of gasoline, containing the insect portions which have come to the surface, from the tomato material. A microscopic count is then made of the remains of the insect.

As high as 30% infection has been noted in some cases in California and Utah. Even 1% to 2% infestation may cause condemning of the product.

It is essential that good sorting and trimming methods be followed. Material should go slowly over the belt, and pickers should be warned to watch for injury caused by the worm. In California, added precautions are being strictly followed. It is up to Tri-State packers to eliminate this danger of having packs turned down.

Tomato Production in New Jersey

C. H. Nissley, Rutgers University, New Brunswick, N. J.

New Jersey grew about 32,000 acres of tomatoes last year. More attention is being paid to quality production and profitable production. It is noticeable that the best growers are those who plan and carry out their operations on time.

The following points are stressed for growing tomatoes successfully:

1. Select a suitable soil. Some soils will not produce a good crop.
2. Use of dolomitic lime is important for many soils, especially those for which tests show this element to be deficient.
3. Select a good canning variety, such as Marglobe, Pritchard, J. T. D., and Rutgers. Certified seed is recommended. About 9,000 acres of Rutgers were grown last year. It is advisable to apply less nitrogen early in the season when this variety is grown.
4. Early field planting is extremely important, and growers now realize this fact. May planting is definitely better than June planting.
5. Use well-grown stocky plants. If southern plants are used, they should be set out as quickly as possible after arrival.
6. Proper fertilization means a great deal, and it is desirable to apply $\frac{1}{3}$ under the row before planting, $\frac{1}{3}$ about four weeks after planting, and the remainder when the first fruits set. Side dressings of nitrogen are sometimes made.
7. Thorough field cultivation is desirable. Cultivate deeply at first and shallow afterwards.
8. Proper spraying is helpful. Bordeaux and arsenical spray is used up to one week before setting plants in the field, and three more sprays are recommended during the season.

Plants should be set deeply and personal attention given to picking the crop.

Rather than spread a small amount of fertilizer over a large acreage, it is best to apply it more heavily on a small acreage.

One man in New Jersey last year had a field of tomatoes which produced 12 tons per acre, and graded 86% No. 1's, 13% No. 2's, and 1% culls.

Potato planters are often used for applying fertilizer in the row, and, for side dressings, attachments to cultivators are common.

Practical Value of Tomato Grading

E. P. Walls, University of Maryland

The following table gives the results of tomato inspection in Maryland for the years 1931, to 1935, inclusive:

Year	Number of factories	Total baskets	Per cent		
			No. 1	No. 2	Culls
1931	27	782,491	30	60	10
1932	4	184,694	37.59	57.88	4.53
1933	5	234,206	28.12	61.66	10.21
1934	14	507,635	43.63	50.74	5.63
1935	11	779,843	52.19	39.28	8.53
Total or average			40.12	51.62	8.26

Any set of grades must recognize variations in commercial value and still be simple enough to be practical in actual practice.

Buying and selling on the basis of grades will encourage better production and better handling on the part of the grower. The practice of paying a flat price for everything accepted discriminates against the best growers. On the basis of grades the grower is paid a suitable premium for stock of high quality which will make a high-quality manufactured product. Such stock can be canned at a minimum cost. On the other hand, there is a penalty for the delivering of poor-quality stock.

On the basis of grades, the canner pays for what he gets and the grower is paid for what he delivers. Each load stands on its own merit.

The greatest value from use of the system to the tomato canner is in securing a high percentage of No. 1 stock. The juice manufacturer, however, may be more interested in the lower percentage of culls delivered.

It is planned to conduct research work this season to determine the wastage within the different U. S. Classifications. For instance, No. 1 tomatoes of the highest quality and others of lower quality within the same grade will be selected, peeled, and canned separately. Some of each lot will be peeled in the regular cannery procedure, and others as carefully as possible. The results should show the usual cannery wastage and the relative value of different quality tomatoes within the same U. S. Grades.

Outlook in the Canning Industry

Carlos Campbell, National Cannery Association, Washington, D. C.

Stocks of canned corn on February 1 were about 1/3 of the original pack, or about 7 and 1/2 million cases. Of these about 2 and 1/2 million are unsold. If sales continue normal, we might expect 4 to 4 and 1/2 million cases, of the 7 and 1/2 million on hand, to be sold before the next pack comes on.

There are no late figures on peas. In many cases, reports are not so good on standard peas, although some rumors have been exaggerated.

It has been difficult to get a full report on tomatoes because of refusals from California packers this year to give out information. In Maryland and Delaware about 21% of the pack is held over. It is probable that there are about 1,400,000 cases on hand in Maryland. In Virginia, about 27% of the pack is unsold. No reliable figures are now available for Indiana.

Acreage of peas has gone upward from 1920 to 1935. Advancing prices have been one cause of the increase in the past three or four years. The 1935 pack was the largest in the past 15 years. From what has occurred in the past, we may expect a drop in the acreage this year to around 275,000 acres, which would be expected to give about 20 million cases of peas.

Corn acreage last year was very large and there will probably be a decline this year.

The 1935 acreage of tomatoes was extremely heavy, amounting to about 455,000 acres. It is difficult to relate the acreage with canned tomatoes because of the recent tendency to shift to various uses of tomatoes for other products, such as tomato juice. In 1935 the juice pack went up. Even if the acreage were known for 1936, it would be difficult to predict what proportions of the various products will be put up. However, we can reasonably expect a reduction in acreage because of poor prices received in some sections.

Fertilizer Placement for Canning Crops

H. H. Zimmerly, Virginia Truck Experiment Station, Norfolk, Va.

Placement means putting the fertilizer in bands in a certain position with respect to the seed or plant. There is little doubt but that it is a valuable advance in the efficient use of fertilizer materials on truck crops. The work has been done within the last two years and has shown placement to be very satisfactory for such crops as lima beans, snap beans, peas, potatoes, spinach, and tomatoes.

The method has not been used in the past because equipment has not been available. Machines for fertilizer placement have recently been manufactured and are now available.

Phosphorus is utilized to much better advantage when the fertilizer is placed in bands because it is not so thoroughly mixed with the soil, and, as a result, is not so quickly changed into an insoluble form.

Specific recommendations cannot now be made for all crops. For wax beans, placement $1\frac{1}{2}$ inches to the side and 1 inch below the seed, in two bands, has been very successful. For peas, $1\frac{1}{2}$ inches to the side and 1 inch below the seed gave good results, while fertilizer placed above or in contact with the seeds caused a decrease in the crop.

In New York, placement for tomatoes in two bands, $2\frac{1}{2}$ inches to the side of the plant, has been most satisfactory.

A great deal of experimental work is still necessary on fertilizer placement. Results have been so encouraging in the work that has been done, however, that further tests are highly desirable.

Many of our eastern soils, especially on the Coastal Plain, are relatively low in magnesium. There is danger, however, of using too much magnesium lime: first, because of its toxic effect, and, second, on account of its tendency to release potash. The need for magnesium lime is readily determined by the soil tests, and its use should be limited to fields where it is actually needed. In general, alternate applications of calcium lime and magnesium lime should be practiced. On soils where the pH value is

below 5.5, liming should be done if a tomato crop is to be grown. Lime aids in preventing phosphorus from becoming fixed as an insoluble compound in the soil. If the soil test shows the presence of soluble or active alumina, liming should be practiced.

Some of the Coastal Plain soils are low in manganese also. Where the tests show manganese deficiency the necessary amount can be added with the fertilizer. The addition of 50 pounds of manganous sulphate to certain crops has given remarkable increases in yield.

Germination Testing Service for Cannery Seeds

F. S. Holmes, University of Maryland

While Maryland has had an agricultural seed law since 1912, the State has no vegetable seed law. With many neighboring states actively enforcing vegetable seed laws it would seem that we should give serious consideration to the possibility of Maryland becoming a dumping ground for inferior vegetable seeds.

The relative importance of testing samples sent to the laboratory as compared with collected samples is increasing steadily. Truckers and vegetable growers already make considerable use of the laboratory. In fact, these groups are believed to purchase their seeds more intelligently than any other group of seed users.

One of the primary roles of seed testing is to furnish such information regarding the characteristics of a bulk of seed to the plant producer that he can judge correctly the usefulness of the bulk to himself at the place and time and for the purpose for which he proposes to plant it. Germination is only one of the characteristics of a lot of seed that should be given consideration in deciding whether or not it is suitable for use. Seeds that will not produce plants are useless, however, no matter how well bred and free of disease they may be. Seeds of low germination which are used should be used at rates that will give the number of plants desired.

We make every effort to have our germination test results represent the plant producing capacity of the seeds. Seeds that merely "sprout" or are weak or otherwise abnormal are not included in the percentage of germination. We count as germinated only those seeds that in our judgment will produce normal plants in the soil under favorable conditions. It is not possible, nor is it believed to be necessary, to make all germination tests in the soil. We do try, however, to calibrate all our germination tests on the basis of soil tests which we make from time to time and whenever asked for by the person sending in a sample.

It is of the utmost importance that samples submitted to the laboratory be truly representative of the lots of seed from which they are taken. The germination test can mean no more than the sample on which it is based. A test based on a small number of seed can be nothing more than a very rough approximation at best, and it may be very misleading. We like to have 1,000 seeds sent for a germination test for which we use 400 seeds. A retest, or a test in soil, may be advisable. Seeds should be sent in strong containers. They should be accompanied by such pertinent information as is available, and if possible should be sent during any month except January or February.

Every plant producer should know the plant producing capacity of the seeds he plants. A germination test will tell.

Use of Soil Tests in Determining Fertilizer Needs

R. P. Thomas, University of Maryland

Soils result from the balance between the destructive and constructive weathering of rocks, rock materials and plant residues. In nature, the constructive forces tend to dominate and a fertile virgin soil is produced. When soils are brought under cultivation by man the destructive forces generally become the most important and soils become less and less productive. This decrease in productivity is a result of loss of organic matter, bases (lime materials) and fertilizer constituents. When the loss has become great enough to be reflected in poor crop yields the soil is said to be in need of either fertilizer, lime, organic matter or maybe all of these materials. In order to detect the need of these substances various tests have been used. At first these were largely for lime, then followed by phosphorus and potassium. As these tests were not wholly satisfactory in many cases, they have been enlarged upon until now soils are tested for their lime requirement, pH value, organic material and the following soluble constituents: calcium, magnesium, aluminum, iron, nitrate nitrogen, ammonia nitrogen, phosphorus, potassium, manganese, chlorides, sulfates and carbonates.

Many of these tests serve as a check upon one another and tend to eliminate the error of individual tests. The need of lime is determined by considering the results from each of the following tests, pH value, soluble calcium, magnesium, aluminum, iron and organic matter and carbonates. In estimating the need for phosphorus fertilization the results of phosphorus tests, calcium, magnesium and organic matter are considered. The potassium results, soluble calcium and magnesium and organic matter are all evaluated in determining the potash needs. The nitrogen need is determined by considering the nitrate and ammonium nitrogen tests, reaction, and organic matter. In addition to the results of tests for evaluating the lime and fertilizer needs the following factors are also equally as important; the origin of the soil, the texture, the management, the previous treatment, the crop response of the previous crop, and the particular crop to be grown. The response which the particular soil in question makes to fertilizers and the reaction which would normally take place between the soil and applied fertilizer also has to be considered. Although the demand for soil testing has been increasing rapidly its use by canners has been more or less limited. Up to the present the greatest demand for soil testing has been for general farm crops and a few special crops like tobacco and nursery crops.

When the soil samples are sent in by either the owner or tenant and the number is not too large, no charge is made for these tests. When the number of samples is quite large and they have been sent in by a cooperative or commercial company, a charge of twenty-five cents per sample is made. This charge covers only the cost of labor and chemicals for making the tests. In addition to the results of the tests, general recommendations for lime and fertilizer are made when enough information accompanies the soil sample for such a recommendation. Oftentimes our recommendations can be of little specific value because very little information is sent in along with the sample. It is just as essential to have all the information known about the soil in the way of cropping and fertilizer treatment as to have a sample of the soil.

A sample should be a good representative of the area from which it was taken. This probably can be best obtained by taking a bucket and small trowel and taking several trowelfuls over the entire area. The contents of the bucket are thoroughly mixed and from one-half to one pint of the composite sent in. If there is much of any variation in the soil such as topography, texture, elevation, plant growth, etc., a separate sample representing each area should be secured. Place the sample in a container which will not absorb moisture from the soil and fall apart in the mail. Also, the container should not have contained any fertilizer or lime materials previously. The samples should be carefully labelled as to the area sampled and the address of the sender.

The soil should be dry enough for good working conditions before the sample is taken. If the soil is too wet, our results often are abnormal and our subsequent recommendations may be incorrect for this reason.

Promising New Varieties of Canning Crops

W. A. Frazier, University of Maryland

Sweet Corn:- A summary on recent development of promising sweet corn varieties will be found elsewhere in this report.

Peas:- Tests of pea varieties have included: (1) a comparison of various Alaska strains, and (2) a determination of the yielding capacity of early sweet varieties. Alaska HF30-1 and Associated Seed Growers Strain 5 of Alaska have given high yields. The HF30 strain, developed at the Maryland station, is a vigorous, puffy-podded Alaska, one to two days later, as a rule, than other Alaskas. Maryland Alaska 126 is a very uniform strain, with ideal Alaska-type pods. There are not available, from seedsmen who carry pea seeds as one of their specialties, various strains which are very uniform and which give satisfactory results.

The introduction of a consistently high yielding early sweet variety of peas would be a valuable contribution to the Maryland canner. At the present time, no one could recommend the substitution of the main Alaska acreage for an early sweet variety, although two have been very promising; namely, Wisconsin Early Sweet, and Resistant Gem. Wisconsin Early Sweet is the more promising of the two, reaching the canning stage at the same time as Alaska, while Resistant Gem is five days later. These two varieties have yielded as well as Alaskas during the past two cool seasons. They need to be tested further. The quality of the canned product is far superior to Alaska. Two new sweets, which have been given favorable advance publicity, are Wisconsin Penin and Mardelah. These will be included in the trials during the 1936 season.

Tomatoes:- There is a need for improvement in our tomato varieties. Every variety has its faults, and there is no real promising variety for Maryland canners on the horizon. Marglobe and Greater Baltimore are still probably better than any of the others. Pritchard does well on heavy soils. Brown's Special has gained in popularity in certain sections of the Eastern Shore. It is a large fruited, rather late variety resembling Stone. The Rutgers, from New Jersey, needs further trials in Maryland. It is a large fruited, rank growing variety, rather late, and has given satisfactory yields in New Jersey. Medium-early varieties such as Clark's Special C, Bonny Best, and John Bear do not seem to yield well in Maryland. Break O'Day is about out of the picture because of its poor foliage, spreading habit, and consequent poor color of the fruit. Early varieties, such as the

recent Penn State, are undesirable for planting for the canning crop.

Thorough trials of new introductions will be continued by the Maryland Station. Possibly from our own breeding grounds there will be produced a new and better variety.

String Beans:- There are no new string bean varieties of promise for Maryland canners. The mosaic-resistant Refugees have not been given a thorough trial, but it is well recognized that the Refugees do not thrive well here. Giant Stringless and Burpees Stringless are still the best for most sections.

Trial Ground Tests of Canners' Seeds
H. A. Hunter, University of Maryland

Some years back it was generally conceded that Maryland, and perhaps most of the Tri-State area, was the dumping ground for inferior seed stocks. This was certainly true in the case of peas, and to a lesser degree with some of the other crops. In recent years the seedsmen have made great strides in the improvement of their many lines of canners' seeds and the condition is not as serious as in previous years. However, there is still room for improvement in most of the crops and there is still some variation in quality of the stocks offered by the different seedsmen.

As a means of comparing the quality of pea seed received by the Maryland canners, trial ground tests have been conducted at College Park or Ridgely for four years. The canners were asked to send in small samples of each of their lots of seed. These were planted in comparative row tests and labelled with the seedsmen's names and lot numbers and numbers which indicated the canners from whom the samples were secured. Detailed records were taken only on those plots which showed up badly. At the proper stage, canners and seedsmen were invited to observe the plantings, and his own particular lots were pointed out to each canner.

These trials will be conducted again this year with peas, and it is planned, also, to make the same type of plantings with sweet corn. About a pint of pea seed will be necessary for each lot, and half or a third of this amount of corn seed will be sufficient.

Such plantings show the relative quality of the seed sent into the State by the several companies, and it is believed that they can be of considerable value to Maryland canners. Each canner is urged to send in his samples, indicating the variety, seedsman, and the lot number of the sample.

COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
STATE OF MARYLAND

UNIVERSITY OF MARYLAND
U. S. DEPARTMENT OF AGRICULTURE
COOPERATING

EXTENSION SERVICE

-5-

NEWS LETTER

Issued by
THE MARYLAND VEGETABLE GROWERS' ASSOCIATION
W. R. Ballard, Secretary-Treasurer.
College Park, Maryland.

Vol. XIII. No. 3.

March, 1936

New Vegetable Tests. Tests of vegetables at Oakland and Salisbury are to be continued this year.

In Garrett County not only will additional varieties and strains be included but tests will be made to determine the best time for planting the various crops.

Both spring and fall plantings of lettuce will be made and new strains from the U. S. Department of Agriculture will be included.

Nine varieties and strains of cauliflower will be tried out. Two strains of sprouting Broccoli and four varieties of Brussels Sprouts are to be included.

Six varieties of peas will be tested as well as the best time for planting. Celery is to be added to the tests this year and both early and late plantings are to be made.

At Salisbury tomatoes both for market and canning, snap beans, and sweet potatoes, are new crops to be added to those tested last year. The plots will be on the farm of Frank Adkins at Salisbury.

How Often to Pick Cukes. Two recent bulletins (Special Bulletin No. 259, Michigan State College, East Lansing, Michigan, and Memoir 163, Cornell University, Ithaca, New York) give the results of studies of varying intervals between the picking of cucumbers. The Michigan results indicate that the total number of fruits produced are shown to increase with frequent pickings, while the total weights of fruits was greatest from the longer intervals. On a graded basis, the percentage of small grade fruits increased with frequent pickings, while on the other hand, the increase in the percentage of the large size from the longer intervals more than offset this effect. The percentage of nubbins and crooks remained constant for the various intervals. Where the intervals between pickings was lengthened beyond four days, a large percentage of culls resulted. It is suggested that under ordinary soil and weather conditions cucumber fields should be picked twice weekly.

Financial returns per acre minus estimated harvesting costs were largest for the four day interval and showed a loss for the one day interval. Even with a wider spread in the prices for the various grades, one and two-day pickings were not profitable. The data indicate that high financial returns are dependent

on large acreage yields which are generally accompanied by a better grade of pickling cucumbers.

The principal point emphasized in the Cornell studies is that the setting of fruit tends to inhibit plant development up until seed coats begin to harden and mature. The removal of fruit before this occurs, apparently releases food material which may be expended in plant growth.

Composition of Pumpkin and Squash Varieties. Bulletin No. 402, Purdue University, Lafayette, Indiana, gives results in testing pumpkins and squash varieties as related to the consistency of the canned product. The conclusions are as follows:

1. The consistency of canned pumpkin and squash is markedly affected by variety, maturity, and chemical composition.
2. Of the four varieties studied, Boston Marrow squash, Kentucky Field pumpkin and Connecticut Field pumpkin yielded fruit producing rather low consistency packs all four years of the investigation.
3. Golden Delicious squash yielded fruit producing a very high consistency pack the first two years, but a low-consistency pack the last two years.
4. Fruits from all varieties yield a pack of higher consistency if canned when slightly immature or barely ripe. For this reason it is imperative for a commercial canner to start packing pumpkin as soon as possible if a pack of maximum consistency is to be obtained.
5. Apparently starch and solids content in all pumpkin and squash varieties reaches a maximum at about the same time that the fruit yields a pack of maximum consistency. This indicates that starch and solids, especially insoluble solids, affect the consistency of the canned product to a great extent.
6. It is possible to markedly increase the consistency of the pack from low-consistency varieties by pressing or by blending with a high consistency variety having high total solids and starch.
7. In the commercial canning of pumpkin and squash as carried out in Indiana factories, large amounts of soluble solids are lost during the wilting process and during the pressing process after wilting.
8. During storage, pumpkins and squashes rapidly lose solids, especially starch, by respiration. Indirectly this causes a decrease in the consistency of pumpkin and squash canned after storage, so this practice should be avoided by commercial canners as far as possible.

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NEWS LETTER

Issued by
THE MARYLAND VEGETABLE GROWERS' ASSOCIATION
W. R. Ballard, Secretary-Treasurer.
College Park, Maryland.

Vol. Xiii. No. 4.

April, 1936.

The Japanese Beetle. This pest is slowly making its way in the State and apparently is prepared to bring a lot of grief to growers along with it. After it appears in a section it seems to require a more or less extended period in which to accumulate into a real menace.

The adult beetle lays its eggs in tunnels in the ground. These hatch into grubs resembling the grub of the June beetle. They feed on the roots of grass, damaging the root system in heavily infested areas so that turf cannot draw enough food and water from the soil to maintain itself. In June the adult beetles appear and start feeding on foliage, flowers and fruit. They are known to attack over 200 kinds of plants.

Among vegetables they appear to be fond of the silks of sweet corn, damaging it to the extent that the ears are not fertilized.

Three methods of control are available: (1) spraying or dusting with arsenate of lead, (2) collecting in traps, and destroying the grubs by treatment of the soil with arsenate of lead. For the latter purpose fifteen pounds per 1000 square feet of area are recommended. The initial cost is heavy, but apparently one treatment will protect a lawn for a period of five or more years.

It appears that the advent of a new pest of this sort gradually brings about an adjustment in which control measures are evolved or a gradual change is made to crops not seriously affected.

The New Adjustment Program. Information regarding the administration of the new soil conservation program appears to be as yet in a very hazy state. Extension Service authorities are trying their best to get some sort of a conception of the steps required to put the scheme into operation. Authorities in Washington appear to be confused as to rulings to be made on the many and complex problems which have arisen.

Vegetable growers should keep informed as well as possible of the progress made and to take advantage of the program in so far as it seems to meet their needs.

"Experts say that at least 400 million dollars worth of soil is being washed away each year. Already 50 million acres have been ruined for further cultivation. Another 100 million acres are badly eroded and 100 million more are eroded.

"Farmers have been raising too much of the kind of crops which exhaust the soil and too little of the kind that rebuilds soil fertility. Every year now more than 3 billion tons of soil are washing and blowing away from the fields from which we must continue to feed and clothe 127 million consumers. This is enough soil to fill a train of freight cars long enough to go around the earth 19 times at the equator. Such losses, if ignored, cause irreparable damage over the years.

"Soil is lost to good use not only when the minerals in it are taken out by crops which humans eat and not replaced by fertilizer, but when the soil is allowed to wash or blow away. So other routes to soil conservation depend on better methods of planting, building ponds and dams, extending wood lots, and so on."

The Cannery Conference Report. The condensed report of papers presented at the Cannery Conference should have been sent to members last month, but due to an oversight this was not done. However, through the courtesy of Mr. H. A. Hunter, these reports accompany this News Letter.

Some of the members undoubtedly produce some crops for canning but in any event many of the results of investigations are as applicable to crops grown for market as for those produced for canning. It is hoped, therefore, that members may be able to glean something of value from these summaries.

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NEWS LETTER

Issued by
THE MARYLAND VEGETABLE GROWERS' ASSOCIATION
W. R. Ballard, Secretary-Treasurer.
College Park, Maryland.

Vol. XIII. No. 5.

May, 1936.

Survey Planting and Fertilizing. Vegetable Crops. The report of a survey on the above subject has just come to hand. The survey was supervised and summarized by H. H. Zimmerley, Chairman of Committee representing the American Society for Horticultural Science. The National Joint Committee on Fertilizer Application, through its Subcommittee on Machine Placement made the survey and the report has been mimeographed and distributed by the National Fertilizer Association. Copies can perhaps be secured from this Association.

The report covers planting and fertilizer application practices in thirty-four states and includes the following crops: Beans, lima; beans, snap; beets; cabbage and broccoli; cantaloupe; carrots; celery; cucumbers; eggplant; lettuce; onions; peas; peppers; parsnips; potatoes; radishes; spinach; squash; sweet corn; sweet potatoes; tomatoes; turnips; watermelons.

Similar surveys have been made with field crops and fruits, and a survey is now being conducted among farm equipment manufacturers to determine just what machines are available for distributing fertilizers.

Marketing Agreements (From Consumers Guide, April 20, 1936).

"Steadying the flow to market of certain California fresh fruits, through a marketing agreement between shippers and the Secretary of Agriculture, so as to gain for growers a larger share of consumers dollars, is probably going to be attempted again this year, as it was last. Tentative approval of the plan has been made by the Secretary. Shippers are now considering the proposal which had already been discussed at a public hearing at Sacramento. The fruits to be covered are pears, plums, Elberta peaches, apricots, and cherries.

"Farmers sometimes get no returns at all when their supplies swamp the market, and often they do not profit proportionately when scarcity compels consumers to pay a high price. Marketing agreements have been used since 1933 under the A.A. A. in an attempt to avoid alternating gluts and shortages of the perishable farm products on the market.

"Devices for preventing markets from becoming glutted, under this agreement proposed for California fresh fruits, include: (1) limiting shipments of poorer grades and sizes when necessary, (2) closing down on shipments entirely for short periods until consumers demand catches up with supplies, (3) controlling shipments from concentration points by allotments to shippers.

"Administration of the program would be in the hands of a control committee of growers and shippers. Successful operation of the program is expected to bring benefits to about 12,000 growers."

Annual Report. The first proof of the annual report of the Association has been received, and it should not be long before the printed report is in the hands of the members. It is too bad the information in the papers could not be made available earlier in the season, but it seems impossible to speed up the printing of the reports appreciably. Growers who are interested in particular reports should take careful notes at the meetings if the information is to be used before the issuance of the printed report.

These reports are available, of course, only to those who keep their membership dues paid up to date. If you have neglected to send in your dollar for 1936, mail it in at once.

The Perennial Contest. The annual contest between the grower and the various insect and disease pests, to see who harvests the crops is again on in deadly earnest. Crop rotation, sanitary measures, and the use of resistant strains are methods not without their value. In addition, however, the grower must keep abreast of the latest information as to the best insecticides and fungicides to use, and the best and most economical apparatus for applying them in the form either of dust or liquid sprays. The need for avoiding arsenic residues, has stimulated the search for non-poisonous compounds and rapid progress is being made in this direction.

Derris root and its extracts seems to be very promising in this respect as an insecticide. Sprays using the derris powder itself have been more effective in some instances than the rotenone extract. Different insects vary greatly in their reaction to insecticides and other factors, such as temperature, have decided effects on the effectiveness of the applications.

Soy Beans. The April Consumers Guide contains an interesting and informative article on the use of soy beans as human food. The composition is such as to give them high value from a dietary standpoint. Edible varieties other than those used for forage are much the best but sources of seed are scarce in this country. The Chinese people make great use of this bean, preparing it in many different ways for human food.

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NEWS LETTER

Issued by
THE MARYLAND VEGETABLE GROWERS' ASSOCIATION
W. R. Ballard, Secretary-Treasurer,
College Park, Maryland.

Vol. XIII. No. 6.

June, 1936

Insect Survey. The Bureau of Entomology and Plant Quarantine in Washington reports that cutworms have done much damage this spring over a wide range of territory. The severe winter seems to have cut down the number of Mexican bean beetles in Virginia and northward.

Seventeen year locusts are much in evidence in Middle Atlantic and East Central States, but are not likely to do much damage except perhaps, to orchards.

New Methods of Handling Vegetables. Growers are often resentful of the place distant growers obtain on their local markets. They do not often inquire into the reasons which make it possible for the shipper to pay transportation charges and still command a higher selling price. Usually analysis shows the product to be better graded and in better condition due to pre-cooling or other process. The local producer could undoubtedly maintain his place on the market to better advantage if he realized how quickly perishable vegetables deteriorate when kept in high temperatures and would take steps to correct the difficulty.

The freezing of vegetables is due to come rapidly to the front as a means of preserving the fresh qualities of vegetables over long periods. These products will probably not compete with the marketing of fresh vegetables because they undoubtedly will find other principal use in supplying the market during the winter or in other off-seasons. One of the problems yet to be solved is how to distribute the frozen product to the consumer, since it deteriorates rapidly as soon as the temperature rises.

Frozen vegetables retain the good qualities of the products much better than does the canning process.

Drouth Hits Eastern Shore. Many sections of the Eastern Shore have suffered seriously from lack of rains. Many of the early crops will be seriously curtailed even if rains are soon forthcoming. Some few favored farmers who have crops planted early on low land bid fair to make some money, but they are in the minority.

There is still time for the late crops if seasonable rains come, but it has been difficult to set plants into the field or to get good germination from seed.

The test plots of tomatoes at Salisbury supervised by the University of Maryland look unusually promising. Good plants from flats were set into the field early in May and good growth has been made.

Experimental Results With Early Potatoes. Spraying tests with early potatoes have been conducted since 1931. In every test the largest yields of grade U. S. No. 1 and U. S. No. 2 potatoes have been obtained from the plots sprayed with Bordeaux mixture 4-4-50 and 2 pounds of calcium arsenate, when this has been compared with calcium arsenate 2-50 and other materials.

The materials used and yields of U. S. No. 1 and U. S. No. 2 are given in the following table:

	<u>Yields in Bushels</u>
Bordeaux 4-4-50 and calcium arsenate 2-50 (average 5 yrs)	199
Monohydrated copper lime dust 20-80 (average 2 yrs)	195
Calcium arsenate 2-50 (average 5 yrs)	156
Basic copper sulphate 2-50 and 2 lbs calcium arsenate (average 1 yr),	181
Burgandy mixture (one year)	164
Burgandy mixture and calcium arsenate 2-50 (one year),	153.

The potatoes have benefitted from the spraying primarily from the control of the leaf beetle although there are other benefits. The results indicate that the Bordeaux-arsenate treatment for the early crop is good practice.

Other Results Since Work Was Begun in 1924:

1. No potato variety has yet been found which can be profitably substituted for the Irish Cobbler for planting the early crop on the Eastern Shore. The Katahdin variety has been studied for four years in comparison with the Irish Cobbler. Its average yield has been slightly larger and it is smoother than the Irish Cobbler, but it is ten days to two weeks later. Other early varieties are being studied.
2. Satisfactory yields can be obtained from any seed source if the tubers are matured in cool soil, if the seed stock is practically free from diseases and if the tubers were properly stored.
3. Home-grown Irish Cobbler seed can be made to come up and mature just as early and yield just as well as northern grown seed if it is kept at certain storage temperatures. Satisfactory results have been obtained with home-grown seed kept in an unheated basement (approximately 40°F.) until January 15 and until February 15 and then kept in a heated basement (approximately 65°F.) until planted. Studies with other storage temperatures are being made.
4. Last year a very good yield (233 bu. primes per acre) was obtained from Irish Cobbler seed stock kept in the State for five years. This seed was from stock which was carefully rogued each year. Many fields from home-grown seed which had been kept for several years were disqualified for

certification in 1935 on account of the prevalence of leaf roll. Growers who are not thoroughly familiar with leaf roll and who cannot rogue their fields thoroughly are advised to grow their seed crop from northern or mountain-grown seed every year or at least not to keep their seed stock more than two years.

Studies with the use of spring-grown seed for fall planting by breaking the dormancy with chemicals like sodium thiocyanate indicate that this method is not profitable for the ordinary potato grower but that it might be profitably employed by seedsmen who wish to multiply their seed stock rapidly. The treatment results in uneven stands, but does not reduce the vitality of the seed stock.

The Annual Potato Tour will occur this year on Friday, June 19th and all members interested in this crop are invited to attend.

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NEWS LETTER

Issued by
THE MARYLAND VEGETABLE GROWERS' ASSOCIATION
W. R. Ballard, Secretary-Treasurer,
College Park, Maryland.

Vol. XIII. No. 7.

July, 1936.

Early Tomato Crop Good. Growers of green-wrap tomatoes on the Eastern Shore have been making money. The crop is large, good quality and the price has ranged from 40 to 80 cents per basket. This will benefit not only the growers, but the labor which must pick, sort, and wrap these tomatoes before they are ready for market.

Fields of late tomatoes for canning purposes look promising on the whole, as does the corn, melon, and cucumber crops. Sweet potatoes got a late start but if good growing conditions prevail may still produce a good crop.

Because of the short crop of early potatoes in the sections south of Maryland, the prospect for Maryland growers looked pretty good. Notwithstanding the fact that the price was quite good at the beginning of the season, growers are now somewhat down in the mouth because the market has slumped. There are no doubt many factors which control the situation but apparently one of them was the flooding of the markets with more potatoes than could readily be absorbed.

THE LIMITATIONS OF COOPERATIVE EFFORTS. (Extracts from article in Market Growers Journal, by H.D. Brown, Secretary Vegetable Growers' Association of America).

"For years I had visions of great advantages that might come to growers that were silling and able to cooperate with each other for the mutual advantage of all.

"Unfortunately, these advantages are seldom realized. As I saw cooperatives fail time after time my faith began to weaken. It seemed that the promoters got all the profit leaving the growers worse off than they were before. As I studied these failures as an unbiased observer several reasons for failure were evident. These are listed in the order of their importance as I see them. (1) Expecting too much from cooperative efforts. (2) Suspicious and independent nature of cooperators. (3) Lack of Grading System, and (4) Underestimating the cost and lack of an adequate system of bookkeeping.

"Excessive Expectations. Cooperatives cannot and should not be expected to solve all of your financial worries. At best they cannot be much more effective than the most successful of growers who also market their own produce. Remember also that cooperatives must eventually compete with cooperatives in their own and other industries. If the theoretical advantages of cooperative efforts could be debunked it is quite likely that the total actual value that

would accrue to individual members could be placed at approximately 10 per cent of his total possible income. It is frequently stated that 90 per cent of the growers problems involves cultural not marketing problems.

"This is a pretty strong statement in view of the recently expected benefits from the A.A.A. and other activities. It is my contention, however, that these activities prove rather than disprove the statement. It would be extremely difficult to prove that A.A.A. activities have paid a dividend to American farmers to say nothing of the general public. To be permanently successful any enterprise must be mutually advantageous to buyer and seller alike. Certainly the A.A.A. has paid no dividends to the vegetable growers of this Nation if we exempt the possible small profits that may have come to Western and Southern growers that marketed their produce under marketing agreements."

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NEWS LETTER

EXTENSION SERVICE

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard,
Secretary-Treasurer.

Vol. XIII. No. 8. College Park, Maryland August, 1936.

Magnesium Deficiency. Under the above title the Virginia Truck Experiment Station has issued Bulletin 89 which discusses the value of magnesium compounds in vegetable production in Virginia. Some of the results have been so remarkable that the complete abstract of the bulletin is herewith reproduced.

"Magnesium is found quite abundantly in most soils and is concentrated deposits of limestones and salts in various parts of the world. In plants, magnesium is found in the substance that is responsible for the green color and also functions with other ingredients in promoting new growth. Annual losses of magnesia (MgO) from the soil, due to leaching and crop removal, approximating fifty to seventy-five pounds per acre in eastern Virginia, are making the soils of this section quite deficient in this element that is so essential to plant growth. The causes for this deficiency are a natural lack of magnesium rock material in the soil, intensive leaching from the soil due to the abundant rainfall and mild climate, the gradual change from the use of organic to mineral fertilizers, and the intensity of the cropping practices.

"During the past five years extensive experiments have been conducted with most of the important truck crops to determine the best methods for correcting and preventing deficiencies of magnesium in the soil solution at the time the various crops have the most concentrated magnesium requirement. It was found that rapid growing crops such as potatoes, cabbage, spinach, cucumbers, and corn have a definite period in their growth during which their magnesium requirement is very high and if the material is not available at that time chlorosis, or a mottled yellowing, occurs in their lower foliage. The inclusion of magnesium in potato fertilizers increased the yield as much as twenty-five barrels per acre with an average increase on thirteen farms of six and eight-tenths barrels per acre. It was found that the potato, due to its rather slow growth during the first thirty to forty days after planting, was able to obtain an adequate supply of magnesium from limestone included in a physiologically neutral 6-6-5 fertilizer. Fertilizers neutralized with dolomitic limestone that was fine enough so that 80% of it would pass through a 100 mesh to the inch sieve gave the most satisfactory response with a minimum of leaching.

"Carrots, beets, sorghum, beans, peas, onions, eggplant, spinach, turnips and radishes also gave satisfactory responses with fertilizers that contain only insoluble magnesium from limestone. These crops gave increases in yield with magnesium of 40% in carrots, 14% in onions, 53% in peas, 25% in beans, 10% in eggplant, 12% in spinach, 60% in turnips and 28% in radishes.

"In cabbage, since rapid growth starts immediately after the fertilizer is applied, a large amount of available magnesium is necessary to prevent a deficiency during the early period of growth. This condition was most satisfactory

met by including 1% of some soluble source of magnesia (MgO) along with dolomitic lime in the fertilizer applied in this crop. The use of magnesium in cabbage fertilizer, markedly increased the portion of the crop that could be cut at the first harvest and increased the yield as much as 85%.

"Some of the other crops tested also gave considerably better yields when some soluble magnesium was included in their fertilizer application. In fertilizers for peppers and cucumbers 2%, in tomatoes 1.5% and in corn 1% of soluble magnesia (MgO) in a mixture made neutral with dolomite is recommended for optimum growth under eastern Virginia conditions. Increases in yield of 116% in peppers, 194% in cucumbers, 90% in corn, and 11% in tomatoes were obtained with fertilizers that contain both soluble and insoluble magnesium.

"Magnesium influenced such factors as earliness and uniformity of maturity, size of root and fruit and the general quality of the marketable portion of the crop. In no case was magnesium in either a soluble or an insoluble form of any detriment to the crops considered.

"Hydrated, burnt, and rock lines containing from 10% to 37% magnesia (MgO) are procurable in Virginia and are recommended for combating the deficiency or building up a reserve in the soil. Calcined kieserite and sulphate of potash magnesia are recommended as soluble sources for correcting deficiencies of magnesium on the more deficient soils. The turning under of a green manure crop at regular intervals and judicious use of dolomitic lime is probably the most satisfactory and economical practice of preventing magnesium deficiency and maintaining a large reserve in eastern Virginia soils."

"During the past five years extensive experiments have been conducted with most of the important truck crops to determine the best methods for correcting and preventing deficiencies of magnesium in the soil solution at the time the various crops have the most concentrated magnesium requirement. It was found that rapid growing crops such as potatoes, cabbage, spinach, cucumbers, and corn have a definite period in their growth during which their magnesium requirement is very high and if the material is not available at that time chlorosis, or a mottled foliage, occurs in their lower foliage. The inclusion of magnesium in potato fertilizers increased the yield as much as twenty-five barrels per acre with an average increase on thirteen farms of six and eight-tenths barrels per acre. It was found that the potato, due to its rather slow growth during the first thirty to forty days after planting, was able to obtain an adequate supply of magnesium from limestone included in a physiologically neutral 6-6-6 fertilizer. Fertilizers neutralized with dolomitic limestone that was fine enough so that 60% of it would pass through a 100 mesh to the inch gave the best satisfactory response at the minimum of leaching.

"Carrots, beets, sorghum, beans, peas, onions, eggplant, spinach, turnips and radishes also gave satisfactory responses with fertilizers that contain only insoluble magnesium from limestone. These crops gave increases in yield with magnesium of 40% in carrots, 14% in onions, 53% in peas, 33% in beans, 10% in eggplant, 13% in spinach, 60% in turnips and 28% in radishes.

"In cabbage, since rapid growth starts immediately after the fertilizer is applied, a large amount of available magnesium is necessary to prevent a deficiency during the early period of growth. This condition was most satisfactory

NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard,
Secretary-Treasurer.

Vol. XIII. No. 9.

College Park, Maryland.

September, 1936.

Effect of Fertilizer Treatments of a Soil on the Quality and Yield of Tomatoes. Work was started in 1927 to test the influence of fertilizer treatments on the quality and yield of tomato fruit. Nitrogen, phosphorus and potassium materials were used alone and in various combinations and ratios. Manure alone and supplemented with phosphorus was also applied. The field work ended in 1931. Representative samples of the fresh ripe fruit were selected from each plot for canning and other determinations as hydrogen ion concentration, total solids and total nitrogen, phosphorus and potassium contents. The canned product was scored for quality.

The results obtained for the two soils used, Sassafras loam and Sassafras sandy loam, indicate that a complete fertilizer high in phosphorus and potassium gives the best yields. Of the single materials used, manure alone was the most satisfactory with superphosphate second. The combination of these two gave the best yields on both of the soils. A 1000 pound per acre application of a 4-16-14 fertilizer was next to the manure and superphosphate treatment in the production of tomatoes. The use of 1000 pounds of fertilizer in a band at the side of the row gave a larger per cent of early harvest than a similar amount applied broadcast. Side dressing with a complete fertilizer had no advantage when compared to a single fertilizer application at the time of setting the tomato plants. Manganese sulphate gave only a slight increase in yield.

The different fertilizer treatments had little influence upon the quality of the canned fruit. There was an indication that an unbalanced fertilizer treatment such as manure, nitrogen, or potash alone produced fruit of slightly lowered quality when canned.

The different fertilizer treatments showed little effect upon the fresh fruit when measured by the hydrogen ion concentration and total solids. The total nitrogen, phosphorus, and potassium content of the tomato fruit was increased slightly when these elements were increased in the soil by fertilizer applications.

A complete fertilizer treatment which produced a high yield also produced tomato fruit of good quality.

Allotment Gardens. A vegetable grower traveling in England cannot help but notice the variety and extent of vegetable production in "Allotment Gardens." All the common vegetables are grown and much interest is taken in the production of size and quality so that prizes may be competed for in the local shows. The gardens vary in size from a fortieth to a tenth of an acre, and are rented by the year. During the month of July some very nice headed lettuce found their way on to the green grocers' stands, and the price paid helped the allotment holder to pay his rent. There are also some flowers which are sold after the family wants

are supplied. The two important items in the flower line were chrysanthemums and carnations, although at the date mentioned these were in full growth. Painted daisies and gypsophila also Shasta daisies were in full bloom and were being sold from the garden.

The gardens generally looked well, no weeds nor diseases, except a little mosaic in the potatoes. However it was found that this only occurred when home grown seed was planted. Scotch seed grown under supervision and inspection was apparently free and quite vigorous. These gardeners seem to be just as reluctant to spray for insects as are our own folks. One of their choicest, favorite vegetables, is the Broad bean. This grows up on a straight, stiff stalk three to four feet high. It is very attractive to the black aphid, which the Englishman calls "Blight." It clusters thickly for about three to four inches on the succulent upper portion of the plants. Instead of spraying with some nicotine preparation, the gardener pinches off the tops and thus destroys all that are clustered there. This helps some as the beans are growing below where the insects are clustered, but under good conditions for the production of the aphids the plants are usually killed before all the crop matures. The climate in England is not warm enough to produce tomatoes so on many of the allotments there are small glass houses, unheated, in which the tomatoes are grown. The gardener rides to the garden on a bike after a days work on the building or in the shop, and puts in the evening hoeing and digging. The temperature is uniformly cool, ranging around 55 degrees F at night to 75 degrees F during the day, so the work is more enjoyable than it would be here with our much higher temperatures. For this reason one wonders how well the Allotments in the new Greenbelt towns will succeed. (T. H. WHITE).

Snap Bean Variety Tests. Three plantings of snap beans were made at College Park this year, with the idea in mind of testing their yielding ability and quality of the beans when canned. Varieties grown were the most popular green pod types: Giant Stringless Green Pod, Asgrow Stringless Green Pod, Stringless Green Refugee, Full Measure, and Burpees Stringless Green Pod. Plantings and harvestings were made at the following dates:

Planted May 22 -- Harvested July 11, 15.

Planted June 23 -- Harvested August 10, 14, 17.

Planted July 30 -- Harvested September 21. (Other harvests to be made)

Highest yields were obtained from Burpees Stringless Green Pod, followed closely by Giant Stringless Green Pod and Asgrow Stringless Green Pod. Full Measure yielded considerably less than these varieties, while Stringless Green Refugee was a failure in the first two plantings, although it is anticipated that a picking will be made from the third planting, since the variety has been observed to yield well in the cool days of late fall at College Park.

Burpees Stringless in each planting has been approximately two days earlier than Giant Stringless, Asgrow, or Full Measure. This may partially account for higher yields from the variety, since pickings were made at the same time. From the standpoint of appearance, it is generally agreed that Asgrow Stringless Green Pod and Full Measure, because of their smooth, round pod are superior to Giant Stringless and Burpees Stringless. From the standpoint of yield, the latter two must be ranked first, however. It must be concluded, also that in most sections of Maryland, the Stringless Green Refugee cannot be expected to give satisfactory yields.

An official grade will be obtained for the canned product of these varieties for all plantings and harvest dates, and will be made available at a later date.

NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard,
Secretary-Treasurer.

Vol. XIII. No. 10. College Park, Maryland. October, 1936.

The Trend of Thought. That the members may be familiar with what the leaders in the vegetable industry in the northeastern section of the country are thinking about and discussing, the following recommendations as reported at the conference in New York City on August 24-25, 1936 are appended:

The production of vegetables had developed into a leading agricultural industry in the past fifteen years. From a local business situated close to consuming centers it has spread to areas far removed from metropolitan districts. In this same period, the increase in the consumption of fruits and vegetables has greatly exceeded increases in other food products. The industry has developed rapidly and with many changes. On this account, its problems have not received the close attention they have needed, especially in the Northwest.

The acreage and production of vegetables in the United States has increased steadily since the World War with the greatest expansion in the Gulf and Pacific Coast States. Because of these production trends, the problem of how to improve the quality and reduce costs of production and marketing has become increasingly pressing to the growers in the Northeast.

Another development in the Northeast has been the tendency toward a more direct method of distribution. The establishment of local auctions, farmers' markets and regional produce markets, along with the use of the motor truck and the growth of selling through mass distributors, has resulted in less volume going through the regular terminal markets and more of it moving direct from the local shipping point to the final distributor. Approximately, one-third of the total volume of Northeast fruits and vegetables are sold through large retail selling organizations and these developments suggest that certain changes are advisable on the part of growers to deal with such organizations.

The consignment system of selling as conducted in many terminal markets serves too often only as a place to assemble the produce and to take orders for its delivery. Large volume of shipments without knowledge or regard for market requirements is at times encouraged by the commission system of selling, or results from lack of knowledge or proper organization on the part of growers. This condition necessitates the development of more efficient systems that will lend themselves to greater grower control and cooperation.

In view of these developments it is recommended in relation to marketing requirements:

1. That methods be urged upon growers and distributors whereby fresh and processed vegetables be harvested, graded, packed and handled, so that field-matured freshness and edible quality be retained unimpaired as nearly as possible until the produce is delivered to the consumer. Grades now established for produce should be re-examined and investigated to ascertain whether they are proper

measures of quality and standards for Northeast produce. Where information is not available to properly accomplish this purpose, we recommend that investigation should be carried on to ascertain how it can be done economically.

2. That inasmuch as New Jersey growers seem to find the local auctions very satisfactory and that New York growers believe that regional markets in conjunction with farmers' markets are fitted to their situation, the possibilities of extending these systems should be investigated. That farmers' wholesale markets, when established in the city, should be located in conjunction with terminal facilities.

3. That producers unite when possible to supply the large distributor with a dependable supply of quality produce.

4. That in view of the fact that the quick freezing process gives promise of lengthening the market season for Northeast produce and of carrying the freshness to the consumer, its possibilities be investigated. That the increased utilization of Northeast vegetables through canning be encouraged as a means of widening distribution and caring for surpluses.

5. That inasmuch as present funds and personnel available for research work in marketing and the allied phases of the Northeast vegetable industry have been insufficient to develop the information necessary for extension workers in the field, more elasticity be permitted in the use of present extension funds for this type of work where desirable.

It is recommended in relation to seed requirements:

1. That State Vegetable Growers' Organizations be urged to request legislation requiring that vegetable seeds sold in the respective states be correctly labeled as to variety and type.

2. That the experiment stations of the Northeastern states be requested to cooperate in drawing up specifications of type of the principal varieties of vegetables grown in the Northeastern section.

3. That state seed laws be enacted, or existing laws be amended, to provide that the germination percentage with the date of the test, determined within a period of three months of the time of ultimate sale, be correctly stated on the seed container. Germination percentage shall be taken to mean the percentage of normal, healthy plants which the seed will produce.

4. That State Vegetable Growers' Organizations and the Vegetable Growers' Association of America be urged to request federal legislation requiring that seeds which enter interstate commerce be correctly labeled on their containers as to variety, type, and germination percentage.

5. That State Vegetable Growers' Organizations and the Vegetable Growers' Association of America be urged to request federal legislation requiring the registration of vegetable varieties for sale in the United States. The requirements should specify that varieties to be registered must be distinct in characteristics and must be suited to definite needs in the vegetable industry.

6. That vegetable seed certifying agencies in the Northeastern states be requested to cooperate in establishing uniform requirements for seed certification.

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF PLANT INDUSTRY

WASHINGTON

DIVISION OF
MYCOLOGY AND DISEASE SURVEY

In compliance with your recent request for information concerning mushroom growing, which has been referred to this Division for attention, we are sending you a copy of Farmers' Bulletin 1587, "Mushroom Culture for Amateurs." This publication covers mushroom growing in its several phases from the beginner's standpoint. For additional information, particularly as to marketing and other commercial aspects of the industry, Circular No. 251, "Mushroom Growing in the United States," is recommended. Unfortunately the free supply of this circular is exhausted and it can be secured only from the Superintendent of Documents, Government Printing Office, Washington, D. C., for five cents. Stamps will not be accepted and all orders and remittances should be made direct to that official. Any additional questions arising in connection with mushroom culture, not covered by these publications, will be gladly answered upon request to the Division of Mycology and Disease Survey, Bureau of Plant Industry, Washington, D. C.

Mushroom spawn is not distributed by the Department. Pure culture spawn, sold in bottles, is considered the best, and may be obtained from the following manufacturers:

American Spawn Company, St. Paul, Minnesota.
Chester County Mushroom Laboratories, West Chester, Pa.
F. G. Evans, Kelton, Pennsylvania.
Edw. H. Jacob, West Chester, Pennsylvania.
L. F. Lambert, Coatesville, Pennsylvania.
Lascarboursa Spawn Company, Kelton, Pennsylvania.
Sharpless Spawn Company, Kennett Square, Pennsylvania.
J. B. Swayne, Kennett Square, Pennsylvania.

These dealers usually issue directions for handling and planting spawn when filling their first order. Their addresses are furnished merely as information, with the understanding that they do not form a complete list, and that the Department does not undertake to guarantee or recommend the product of any particular concern.

Very truly yours,

Senior Mycologist in Charge,
Mycological Collections.

NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard,
Secretary-Treasurer.

Vol. XIII. No. 11. College Park, Maryland. November, 1936.

Substitute for Manure in Hotbed

E. M. Emmert of the Kentucky Agricultural Experiment Station gives the following:

Recommended Procedure for Making a Cornstalk Hotbed.

Make the hotbed the same as for manure but about 6 inches deep. Cut the stalks to 1- to 2-inch lengths and tramp in until about 2 inches deep, spread about $\frac{1}{2}$ pound of cottonseed meal per sash on this layer, and repeat until about 12 to 18 inches deep. The depth should vary with the weather expected and the amount of heat desired. If 12 inches of manure usually are used, about 18 inches of stalks should be used. Limestone, sodium carbonate, and phosphate may be used if desired. They are especially valuable where plants are to remain a long time or are to be matured and the roots allowed to grow into the cornstalks or where the stalks are to be used as manure. Good results can be obtained with cornstalks alone.

One of the difficulties is in thoroughly soaking the stalks. There are three possibilities. (1) The most efficient is soaking the stalks in barrels before placing in the bed. (2) The beds may be soaked with water for a hose. In applying water with a hose the water tends to run through the stalks. If the soil is put on and water applied through this, better results are obtained. Long, thorough soaking is necessary. (3) If the bed is made up before a rain or a considerable time before needed, rain may usually be depended on to thoroughly wet the mass of stalks.

About 4 inches of soil should be used. Plants should be set or seeds planted as soon as the heat is about 70 degrees F. in the stalks. There is no danger of overheating.

The advantages of the cornstalk hotbed are: (1) It does not become too hot, (2) no heat is wasted as in the excessive stages of manure heating, (3) there is no injury from fumes, (4) heat lasts for one to two months, (5) the heat is uniform, (6) cornstalks usually are cheap and readily obtainable, and (7) rotted cornstalks, especially when cottonseed meal, sodium carbonate, superphosphate, and limestone were used, are a good substitute for manure as a fertilizer.

SWEET CORN FIELD TRIALS

1936

Special Report - November 10, 1936

R. G. Rothgeb

Department of Agronomy

University of Maryland Agricultural Experiment Station

College Park, Maryland

SWEET CORN FIELD TRIALS

at

College Park, Maryland

This report gives results obtained from variety trials on the Clay Farm at College Park for the year 1936. One hundred and twenty-two seed stocks of varieties and hybrids were grown under comparable conditions as part of the corn improvement program of the Agronomy Department of the University of Maryland.

In these trials an attempt is being made to study the performance of the many new hybrids in comparison with established sorts. It is hoped that the data thus obtained will not only be of scientific interest to corn breeders, but also will be of direct assistance to seedsmen and growers.

Season

Although the rainfall was somewhat deficient and unevenly distributed, yields as a whole were above average for this location. Dry hot weather during the first half of July caught the early corns in the flowering stage thus limiting yields to a marked extent. Heavy rain on July 23rd came in time to help the late corns such as the Evergreen and Country Gentleman types. Wilt was not a serious factor in the 1936 trials. Many of the susceptible stocks made a relatively better showing than in preceding years when this disease caused serious damage.

Methods

Soil Management. - For six years sweet corn trials have been conducted in the same field on a sandy loam soil of medium fertility. Adjacent strips of plot land have been alternated in a two-year rotation of sweet corn and fall-sown small grains, a grass-clover mixture being seeded with the latter and turned under for corn. Previous to plowing for sweet corn, a liberal application of barnyard manure has been made, and immediately before planting, 400 to 500 pounds of a mixed fertilizer has been broadcast. The analysis and rate has varied slightly from year to year. In 1936 a 3-12-6 was put on at the rate of 400 pounds per acre.

Planting. - Planting was done with hand planters on May 22nd and 23rd, in hills spaced 3.5 feet each way. An excess of seed was dropped and the stand subsequently thinned to two plants per hill. Each test entry was replicated on four plots distributed over the trial area. Each plot consisted of a single row ten hills long. Trial entries were grouped according to date of maturity, and members of the several groups planted at random within the group for minimizing competition.

Records

Name. - In most cases the name and number given by the distributor of the seed are used. A star (*) is placed before each stock known to have been distributed for commercial use. Entries classed as hybrid are first generation crosses involving one or more inbred lines, the top cross being the case where an inbred line is used as one parent and an open-pollinated variety as the other parent. Open-pollinated stocks, regardless of origin, have been listed as varieties.

Source of Seed. - Prompted by a sincere desire to ascertain what strains and hybrids are best adapted to Maryland, corn breeders, seed companies, and others, have kindly cooperated by furnishing seed samples. Generous thanks are due the following contributors:

<u>Abbreviation</u>	<u>Name</u>
Asgrow	Everett B. Clark, Associated Seed Growers, Inc. New Haven, Connecticut.
Bonn.	Leo Bonnewitz, Van West, Ohio.
Conn. S.	W. Ralph Singleton, Connecticut Agricultural Experiment Station, New Haven, Connecticut.
F. H. W.	Kenneth Kopf, F. H. Woodruff & Sons, Milford, Connecticut.
Ga. S.	R. P. Bledsoe, Georgia Agricultural Experiment Station, Griffin, Georgia.
Ind. S.	G. M. Smith, U. S. D. A., and Purdue University Agri- cultural Experiment Station, Lafayette, Indiana.
Ia. S.	E. S. Haber, Iowa State Agricultural Experiment Station, Ames, Iowa.
Landreth	H. L. Mills, D. Landreth Seed Company, Bristol, Pa.
Md. S.	University of Maryland Agricultural Experiment Station, College Park, Maryland.
Robson	J. W. Robson, Robson Seed Farms, Hall, New York.
Texas S.	P. S. Mangelsdorf, Texas Agricultural Experiment Station, College Station, Texas.
Thomas	Thomas & Company, Frederick, Maryland.
W. Bros.	Whiteford Brothers, Whiteford, Maryland.
Wood	T. W. Wood & Sons, Richmond, Virginia.

Maturity. - During the flowering period of each variety or hybrid, a day-to-day count was made of plants showing silks. Depending upon the lateness of the variety and the appearance of the ears, harvesting was done 18-23 days after approximately one-half of the plants had silked. Harvesting was completed in one picking.

Most varieties were in the early canning stage. In no case was the corn too hard for canning. The first picking of corn for roasting ears could have been made 2 to 4 days earlier than the time indicated in the table.

Since the time required for sweet corn to reach maturity varies with the temperature during the growing season, proper allowance must be made in applying the results of this particular trial to other planting dates and locations--- the cooler the season, the more days required..

Premature Dying. - Plants which showed wilting, or had a greyish appearance, or presented excessive firing of the upper leaves at the time of harvesting, were put in this class. Wilt, root rot, and general inability to withstand adverse growth conditions such as drought, are largely responsible for such symptoms. In 1936 bacterial wilt was principally responsible for dying plants. Although this observation does not strictly differentiate causes, it gives a good indication of plant vigor.

Length of Ear. - The average length of husked marketable ears.

Yield. - The weight of the corn in the husk as it came from the field is given as total yield. All ears of sufficient size to have kernels on them were pulled. Due to the inclusion of some nubbins which the practical grower would probably have left in the field, these yields are slightly large. For the same reason the husk and cull loss is somewhat high.

Correction for stand was made for hills completely missing, but not for hills with only one plant present.

Marketable ears are ears suitable for canning or market. Culls consist of immature ears, poorly filled ears, ears having less than three inches of their length well filled with kernels, smutted ears, and ears with worm injury too deep for trimming.

For benefit of the market gardener the number of marketable ears per 100 plants is given. Had harvesting been done by successive pickings instead of all at one time, the number of marketable ears would have been slightly greater. Also, thicker planting doubtless would increase this number considerably, especially on fertile soil.

Observations Based on the Trials

1. Careful field trials and quality tests, usually for several years, are necessary to establish the worth of a particular hybrid or variety in areas differing in soil and climate. Not all hybrids are good.
2. Well adapted hybrids have been more uniform in maturity and other growth characteristics than open-pollinated varieties. However, field irregularity in soil fertility, stand, weed distribution, etc., may partly nullify hereditary uniformity. Breeding has not overcome poor culture.
3. In spite of the poor appearance of the seed of many hybrids, little trouble has been experienced in getting a good stand.
4. In 1936 bacterial wilt was present but caused far less damage than in the two preceding years. For this reason susceptible sorts made a relatively good showing.
5. In 1936, as in other years, early varieties were less productive than late ones.
6. Compared to open-pollinated varieties of similar season, early hybrids have given greater increases in yield than have late hybrids.
7. Of the hybrids requiring 76 or fewer days for maturity, Spancross-39, Senecross-39, Seneca Golden, Top Cross Maine Bantan, and Golden Sunshine x Iowa 45, were outstanding in 1936.
8. Golden Cross Bantan maintained its reputation for productivity and high quality.
9. Golden Cross Bantan stocks from different sources showed some difference in uniformity and yield.
10. Purdue 39 x Iowa 45, a yellow hybrid in season with Golden Cross Bantan, appeared very promising as to appearance and yield.
11. A number of Whipple crosses were included in the trials, but none seemed to have any advantage over Golden Cross Bantan.
12. In the Evergreen class, Iowa hybrids, 191x1248, 777x191, and 1363x1248 showed high productivity in 1936.
13. Several New England Evergreen and Country Gentleman crosses appeared to have a slight advantage over open-pollinated stocks from the same region.
14. In spite of tough, tight husks, southern sweet corns such as Honey June and Surecropper Sugar showed considerable worm infection.

SWEET CORN FIELD TRIALS

1936

Place: Clay Farm
College Park, Maryland

Planted May 22-23

Variety	:	Days	Plants	:	Ave.	Total	Husk	Husked market-
(open-pollinated)	:	Source	to	:	dying	Plant	Ear	:Yield :& Cull:able ears per
or	:	of	Matur-	:	early	Height	Length	:per A.:Loss :100 plants
Hybrid	:	Seed	ity ^a	:	Pct.	Ins.	Ins.	: Tons : Pct. : Lbs. : No. :

WHITE

Miscellaneous - Variety (71-80 days)

*Mammoth White Cory									
E245.2	Asgrow	71	2.6	63	6.4	1.40	37	25	67
*Early Columbia	F.H.W.	71(73)	0	55	7.3	2.15	52	32	76
*Vanguard	Land.	73	0	75	7.7	2.83	47	45	93
*Minn. Extra Early	Land.	75	2.8	64	7.7	1.91	58	24	92
*Howling Mob M35185.1	Asgrow	76	1.4	70	8.3	---	---	---	91
*Black Mex. 16003	"	77	0	64	8.1	2.41	53	34	106
*Howling Mob	Land.	80	0	68	8.3	---	---	---	100

Miscellaneous - Variety (87-90 days)

Hopeland	Md. S.	87	0	114	8.7	4.19	48	65	104
*Money Maker	Land.	87	0	94	8.9	3.93	53	54	115
*Aunt Mary's	Bonn.	88	0	78	7.7	4.09	54	53	136
*Long Island Beauty	Land.	89	1.3	86	9.2	4.18	45	68	96
*Oregon Evergreen	Asgrow	89	0	77	8.5	3.61	45	61	139
Henry Clay	W. Bros.	90	0	80	6.5	3.51	56	44	133

Evergreen - Variety (80-90 days)

(Important canning type in Maryland)

*Stowell's Evergreen	Land.	80(78)	1.4	77	8.2	3.30	59	40	83
"	Md. S.	85	0	82	7.9	4.05	51	60	100
*Clarks Early M3561.4	Asgrow	85	0	84	8.1	3.98	53	56	97
*Early Evergreen	F.H.W.	85	0	80	8.1	3.75	56	49	74
*Stowell's	F.H.W.	88	0	82	8.3	3.74	44	61	87
*Improved Stowell's									
M3592.1	Asgrow	90	0	79	8.0	3.44	40	59	95

Evergreen - Hybrid (83-90 days)

*Top Cross Evergreen	F.H.W.	83	0	83	8.4	3.99	51	58	99
12E x 257	Ia. S.	83	0	81	9.1	3.99	54	55	103
*Redgreen	Conn.	83(84)	0	70	7.9	3.72	51	52	140
*12E x 1248	Ia. S.	84	0	85	7.4	4.33	55	55	100
*191 x 1248	" "	84	0	82	8.5	4.25	44	68	97
777 x 191	" "	85	0	84	9.3	4.36	50	74	108
16-5-3 x 4-6-1	Ind. S.	85	0	74	7.6	4.10	54	56	109
*Ev. Hybrid A	F.H.W.	85	0	81	8.3	4.31	56	56	91
*Ev. Hybrid B	"	87(85)	0	79	7.7	4.07	59	47	96
Top Cross	Thomas	87(85)	0	84	8.0	3.98	58	49	83
1363 x 1248	Ia. S.	87	0	84	7.6	4.29	40	73	135
*14 x 5 E 97.1	Asgrow	87	0	73	8.3	3.45	45	58	99

Variety	:	:	Days	:Plants:	:	Ave.	:Total	:Husk	:Husked	Market
(open-pollinated)	:	Source	:	to	:Dying	Plant	: Ear	:Yield	:& Cull	able ears per
or	:	of	:	Matur-	Early	Height	Length	:per A.	Loss	:100 plants
Hybrid	:	Seed	:	ity ^a	Pct.	Ins.	Ins.	: Tons	Pct.	: Lbs. : No.

Narrow Grain Evergreen - Variety (88-90 days)

*Midwest 18008W	Asgrow	88	0	78	8.0	4.48	52	62	114
*Delaware Strain	Thomas	89	0	95	7.6	3.92	49	56	120
*M35203.4	Asgrow	90	0	82	7.4	3.28	46	51	92

Narrow Grain Evergreen - Hybrid (84-87 days)

Top Cross A206.1	Asgrow	84	0	79	8.3	4.38	54	58	114
Top Cross A206.2	"	85(84)	0	84	3.2	3.96	43	65	99
*" "	F.H.W.	86(85)	0	88	7.7	4.33	52	60	96
*26 x 15 E206.1	Asgrow	87	0	74	7.6	3.87	47	60	107

Country Gentleman - Variety (87-89 days)

(Important canning type in Maryland)

*Midwest 18004W	Asgrow	87	0	85	7.8	3.61	42	61	111
*M3519.4	"	88	0	78	7.9	3.18	49	47	94
Maryland strain	"	88	0	72	7.7	3.24	51	48	86
*HL.35	Land.	89	0	77	7.9	3.43	44	56	118
*8712	F.H.W.	89	0	85	7.9	3.49	45	59	121

Country Gentleman - Hybrid (85-93 days)

22-2-2 x 6355	Ind. S.	85	0	85	7.5	3.65	49	54	126
981-2 x 6355	" "	85	0	73	7.6	3.29	51	48	98
Top Cross x 419	Asgrow	85	0	71	7.9	3.63	49	55	109
*Top Cross x 440	"	87	0	71	7.4	3.55	47	53	104
*24 x 19	"	87	0	80	7.8	3.26	41	54	106
*19 x 9	"	87	0	81	7.6	3.28	40	60	132
900 x 1612	La. S.	87	0	84	8.2	3.99	54	53	110
(1612x908) x 1445	" "	87	0	81	8.0	3.51	48	55	133
*1445 x 1612	" "	89	0	80	7.6	3.27	42	55	127
1620 x 1434	" "	91	0	80	8.5	3.96	41	59	112
908 x 1612	" "	93	0	86	8.1	3.27	51	47	108

Tall, Late, Southern Sweet (90-105 days)

(tough, tight husks)

*Southern Sweet	Wood	93(95)	0	98	7.5	4.61	52	65	111
Sure Cropper Sugar	Texas S.	101	0	94	8.4	4.18	55	60	102
*Suré Cropper Sugar	Asgrow	101	1.6	111	8.4	4.46	59	59	98
*Honey June M35180	"	101	0	119	7.8	3.54	46	62	86
*Honey June 118	Land.	101	1.8	106	8.0	3.67	47	65	94
Honey June	Texas S.	101	1.9	110	8.0	4.28	46	80	115
Hybrid 428	Ga. S.	105	0	121	7.8	4.54	67	50	114
Hybrid 439	" "	105	0	122	7.3	4.78	60	56	114
Hybrid 496	" "	105	0	119	7.3	4.47	63	49	120

YELLOW

Spanish Gold - Variety (66 days)

*Spanish Gold	El70.1 Conn. S.	66	0	47	5.7	1.11	60	14	70
*Spanish Gold	F.H.W.	66	1.4	47	5.4	1.10	64	12	58

Golden Cross Bantam (Popular commercial hybrid)									
Golden Cross Bantam	Conn. S.	78	0	64	8.3	3.06	45	50	128
* " "	" Asgrow	78	0	64	8.4	3.23	47	49	118
" "	B.55124 Ind. S.	79	2.5	58	7.9	3.03	49	44	117
Golden Cross Bantam	Robson	80	0	58	8.5	3.13	46	50	130
* " "	" Land.	80	1.4	61	8.0	2.79	57	33	110
* " "	" F.H.W.	80	1.4	65	8.2	3.43	52	48	124

Variety	:	:	Days	Plants:	:	Ave.	Total	Husk	Husked market-
(Open-pollinated)	:	Source	to	Dying	Plant	Ear	Yield	& Cull:	able ears per
or	:	of	Matur-	Early	Height	Length	per	Loss	100 plants
Hybrid	:	Seed	ity ^a	Pct.	Ins.	Ins.	Tons	Pct.	Lbs. : No. :

Miscellaneous Yellow - Hybrid (74-80 days)

*Golden 1804-2 x 45	Ia. S.	74	0	62	7.8	2.78	43	45	116
Golden 1801 x 45	" "	77	0	64	7.7	2.71	45	43	99
*Purdue 39 x Ia.45	" "	78	0	60	8.4	3.88	45	61	130
Golden Cross B.x 14	Ind. S.	78	0	58	8.3	3.14	46	49	129
1339-1-8-1 x P51	" "	80	1.5	65	8.1	3.11	44	51	140
Hybrid 51415	" "	80	2.7	62	8.0	3.18	46	48	123
Golden Cross Bx1313	" "	80	2.7	65	7.7	2.54	53	34	99
Golden 13 x 45	Ia. S.	80	0	69	7.3	3.52	47	55	138
Golden 20 x 45	" "	80	0	63	8.2	3.46	51	51	110

Golden Giant - Variety (78 days)

*Golden Giant 16067	Asgrow	78(77)	1.4	64	7.9	3.03	52	42	100
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Whipple Early Yellow - Variety (77-78 days)

*Whipple Early Yellow	F.H.W.	78	2.7	64	7.6	2.89	54	37	81
*Whipple M35175.1	Asgrow	77	0	66	8.2	2.78	53	37	83

Whipple - Hybrid (75-80 days)

Whipcross 6-2	Conn. S.	75(76)	0	62	7.9	2.52	53	35	78
*Whipcross 39-6	F.H.W.	77(76)	0	64	8.1	2.41	46	36	83
Whipcross 7-2	Conn. S.	77	1.4	59	7.5	2.33	45	37	96
Whipcross 39-2	" "	78	1.5	61	7.9	2.78	52	39	100
*Whipcross 39-2	F.H.W.	78	2.6	57	7.7	2.61	45	41	103
*Top Cross 16140	Asgrow	78	0	61	8.0	2.76	53	38	90
*Whipcross - 39	F.H.W.	80	0	62	8.1	3.06	48	45	98
Whipcross - 39	Conn. S.	80	0	63	8.0	2.70	43	45	97

Miscellaneous Yellow - Variety (84-87 days)

*Bloomsdale Golden H706	Land.	84	0	60	8.7	2.71	57	35	80
*Bantam Evergreen M3510.41	Asgrow	85	1.4	65	7.8	--	--	--	96
*Bantam Ev. 3-719	F.H.W.	85	1.8	64	7.9	--	--	--	96
*Golden Colonel (yellow Country Gentleman type)	Asgrow	87	2.7	80	7.3	3.31	47	53	107

Miscellaneous Yellow - Hybrid (83-87 days)

*Bloomsdale Golden Top Cross H707	Land.	83	0	61	8.5	2.97	52	44	98
*Bantam Evergreen 24 x 39	Asgrow	83	0	63	8.4	3.34	53	45	89
442(3)2-2-1 x 1339-1-8	Ind. S.	83	0	64	8.1	3.01	37	57	93
*Kancross	F.H.W.	86(88)	0	69	8.5	3.80	52	53	115

a. Corn was harvested 18 to 23 days after approximately one-half of the plants had silked-- the later the variety, the longer harvesting was delayed. Most varieties were in the early canning stage. None showed any denting of kernels. When harvesting was not done on the proper maturity date, the actual number of days to harvest is enclosed in parenthesis.

*. Known to have been listed for sale in 1936.

Summary of Regional Sweet Corn Trials in 1936.
Yields are stated in tons of husked marketable ears per acre.

Variety ₁	Location and Yield				Husk & Cull Loss
	College:	Belts-:	Ridge-	West-	Per cent of
	Park	ville*	ly*	minster:	Total Yield
Stowell's Evergreen (College Park strain)	1.98	---	2.88	2.19	44.3 ₂
Stowell's Evergreen (Westminster)	---	---	2.54	1.99	46.0
Improved Stowell's Evergreen (Connecticut)	2.06	2.08	2.36	2.19	44.0
Evergreen Hybrid 14 x 5	1.90	2.18	2.52	1.81	41.5
Narrow Grain Evergreen (Westminster)	---	---	---	1.64	50.8
Narrow Grain Evergreen (Connecticut)	1.76	1.87	2.08	1.51	48.0
Narrow Grain Evergreen Hybrid 26x15	2.04	2.27	2.56	1.93	44.8
Country Gentleman (Westminster)	1.60	---	2.08	1.87	45.7
Country Gentleman (Connecticut)	1.59	1.38	1.77	1.74	49.3
Country Gentleman Hybrid 24x19	1.91	1.74	2.46	1.85	38.8
Country Gentleman Hybrid 19x9	1.97	1.50	2.04	1.72	43.9
Golden Colonel	1.76	1.47	2.01	1.30	47.8
Golden Cross Bantam	1.70	1.94	2.12	1.78	47.3
Top Cross Bantam	1.26	---	1.71	1.48	51.7

1. All seed furnished by Associated Seed Growers, Inc. except the College Park strain of Evergreen. All other seed except the Westminster strains was produced in Connecticut. The former has been perpetuated at Westminster, Maryland, for four generations.
 2. Unweighted average for all locations. Based on total field weight in the husk.
- . A dash indicates that the variety was not planted in the trials at that location.
- *. Yields at Beltsville obtained in cooperation with H. B. Gardner, Associate in Olericulture; at Ridgely, with H. A. Hunter, Extension Specialist in Canning Crops, University of Maryland.

NEWS LETTER

Issued by
The Maryland Vegetable Growers' Association
W. R. Ballard,
Secretary-Treasurer.

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Breeding Blight Resistant Potatoes

It has been estimated that during the ten year period, 1926-35, the yield of potatoes was reduced by more than 9,000,000 bushels, through the ravages of the late blight.

There are resistant varieties but most of these have no commercial value. Breeding for resistance has been under way for some time both in Europe and in the United States. The United States Department of Agriculture in cooperation with some of the states is carrying on extensive studies in this direction.

Some important results have been secured and there is considerable promise for the future. One promising variety will be given extensive tests as soon as seed stock are increased to the point where it can be distributed widely.

Food For Thought

Vegetables are important sources of vitamins and mineral salts and the publicity given to these essential elements in recent years has undoubtedly stimulated the increased use of vegetables in the diet.

Recent issues have dealt particularly with calcium and phosphorus in their relation to bodily health. The following paragraphs are quoted from that publication.

"CALCIUM is the main mineral in the bone structure, but there we find it in the form of calcium phosphate. That means that the calcium has combined with phosphorus. Without the correct proportion of phosphorus, the calcium cannot do its major job, bone building.

"PHOSPHORUS, second largest mineral contribution to the body's weight, accounts for about a pound and a half in the weight of an average 150-pound man. Much of this phosphorus is in the bones but it is no such specialist as calcium. No other mineral, in fact, plays important parts in so many dif-

ferent essential functions. One of these functions is helping to keep the blood neutral--not too much acid nor too much alkali. Another is to keep up the proper liquid content of the tissues. But probably the most outstanding job phosphorus does is in the building of cells.

"CELLS make up the body. They are so tiny that in one cubic inch of blood, for instance, there are 70 billion of them. To grow or develop, the body must multiply its cells. Different cells make different kinds of structure. Some develop into bones, some into nerves, some into blood, others into parts of the digestive system, and so on and on. The center of the cell, called the nucleus, governs its activities. In that nucleus of each of the billions of billions of body cells we find phosphorus. The very life of the body has a direct dependence on the supply of phosphorus.

Foods Rich In Calcium

Almonds	Endive
Beans, common or	Figs, fresh or dry
kidney, dry or fresh,	Hazelnuts
shelled; also snap	*Kale
or string	Kohlrabi
*Beet greens	Leeks
*Broccoli, sprouting	Lettuce
*Buttermilk	Lobster
Cabbage, green	Maple sirup
*Cabbage, Savoy and	*Milk, whole or skimmed;
nonheaded	evaporated, condensed,
Carrots	and dried
*Cauliflower	Molasses
*Cabbage, Chinese,	*Mustard greens
nonheaded varieties	Okra
Celery	Oysters
*Chard	Parsnips
*Cheese, Cheddar or	Romaine
American	Rutabagas
Cheese, cottage	*Sesame seed
*Cheese, Swiss	Shrimp
Chickpeas	Sorghum sirup
Chicory, leaves	Soybeans
*Clams	Soybean flour
*Collards	Spinach
Cottonseed flour	Spinach, New Zealand
Cream	*Tendergreens

*Dandelion greens
Dock or sorrel
Eggs, whole
Egg yolk

Turnips
*Turnip tops
Watercress

Foods Rich in Phosphorus

Almonds
*Barley, whole
*Beans, common or kidney,
dry or fresh, shelled
Beans, lima
Brussels sprouts
Buckwheat flour
*Buttermilk
Cheese, Cheddar or American
Cheese, cottage
Cheese, Swiss
Chickpeas
Clams
Cocoa
Collards
Corn, green, sweet
Cornmeal
*Cottonseed flour
*Cowpeas, or blackeyed
peas, shelled
Dandelion greens
*Egg, whole
*Egg yolk
*Fish
Hazelnuts
Kohlrabi
*Lentils
*Lobster

Meats (having more
than 6% protein)
*Meats, lean or medium
fat (having more than
12% protein)
*Milk, whole or skim-
med; evaporated, con-
densed, and dried
*Oysters
Parsnips
Peanuts
*Peas
Pecans
Rice, brown
*Rice, bran
*Rice polishings
Rye flour
*Sesame seed
*Shrimp
*Soybeans
*Soybean flour
Spinach
Walnuts
*Wheat, whole grain,
graham or whole
wheat flour
*Wheat bran
*Wheat germ

*Excellent.